American Artisan and Hardware Record

Sheet Metal—Roofing—Warm Air Furnaces—Stoves

Vol. 92, No. 19 CHICAGO, NOVEMBER 6, 1926 $2.00 Per Year

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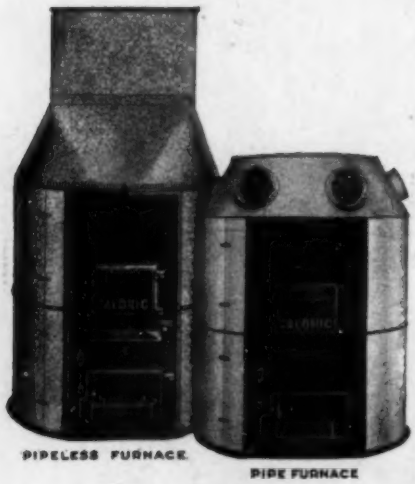

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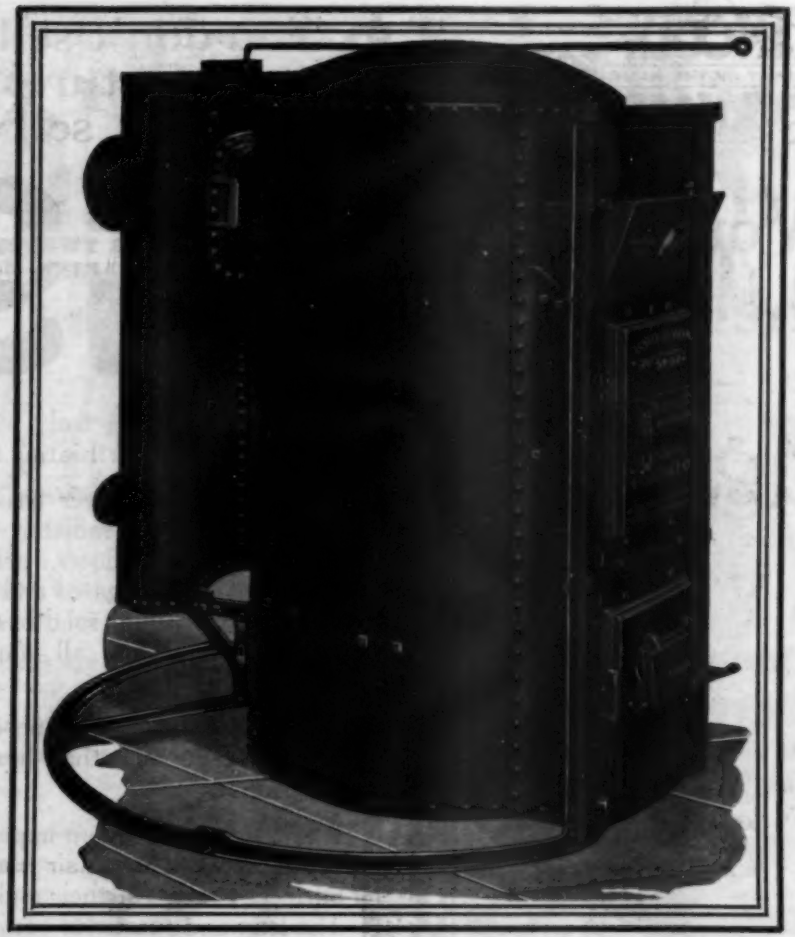

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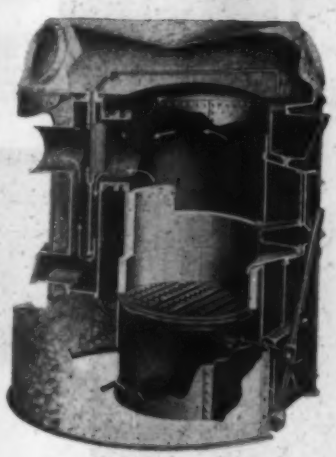

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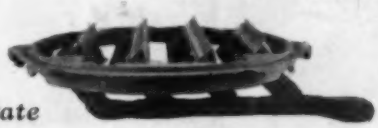

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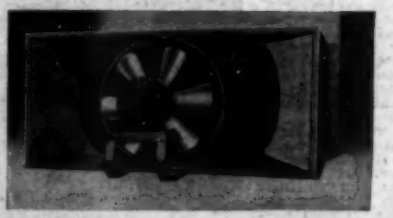

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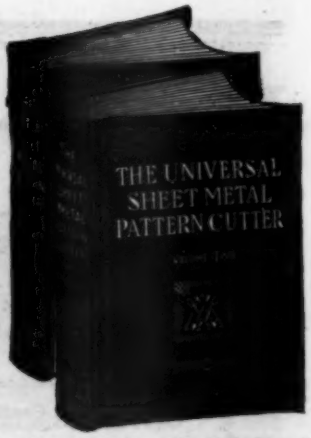

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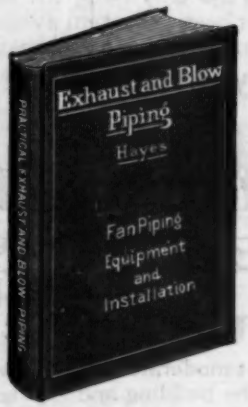

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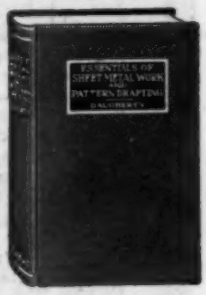

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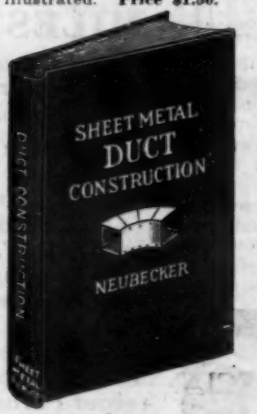

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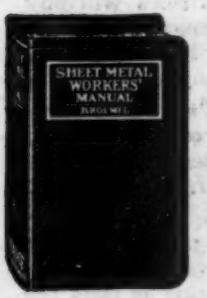

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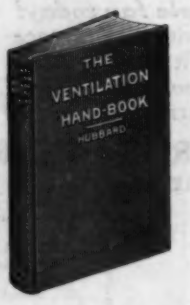

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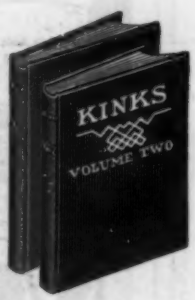

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AN ACHIEVEMENT

An explanatory note regarding service to readers of AMERICAN ARTISAN. *This paper is now nearing the completion of a half century of service. For almost fifty years it has catered to the needs of the men in the industries which it represents. At no time during its long and successful career has* AMERICAN ARTISAN *been in a better position to render complete, adequate service to its readers than it is today. In addition to the matter contained in our regular weekly publication, we maintain Service Departments for the use of our readers. If you have a problem to solve, we courteously invite you to submit it to us for solution. In what better way can we learn of your problems than from you direct?*

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The PENINSULAR STOVE COMPANY

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American Artisan and Hardware Record

Vol. 92. CHICAGO, NOVEMBER 6, 1926 No. 19.

Figure 1. A Warm Air Furnace Heated Residence, Urbana, Ill.

A Warm Air Heating System for an Eight Room Residence

By William H. Severns, Assistant Professor of Mechanical Engineering, University of Illinois

THE warm air furnace heating system described hereafter was designed by the writer and was installed recently in the house illustrated by Figures 1, 2, 3, and 4.

The house under consideration is of frame construction, the outside walls being of plaster, lath, studding, ¾ inch yellow pine shiplap, Bishoporic base, and three coats of waterproof stucco. The only feature in the house construction that is not common in its locality is the use of insulation in all ceilings below attic spaces.

The insulated ceiling construction consists of plaster, lath, and 3 inches of number 12 Insulex poured on top of the lath and plaster between the ceiling joists. With the exception of the attic space above the sleeping porch the attics are all floored with ¾ inch yellow pine shiplap. This type of ceiling construction reduces the coefficient of heat transmission for ceiling below attic spaces from 0.45 B. t. u. for lath and plaster to 0.10 B. t. u. per square foot, per hour, per 1 deg. F., for a ceiling of plaster, lath, 3 inches of Insulex, and ¾ inch flooring.

Eight of the nine rooms of the house are heated by the furnace plant. The enclosed sleeping porch was provided with electric outlets so that an electric heater might be used in extremely cold weather, as the owner does not wish heat in the room under ordinary conditions.

The minimum temperatures experienced in Urbana, Illinois, where the house is located, are in the

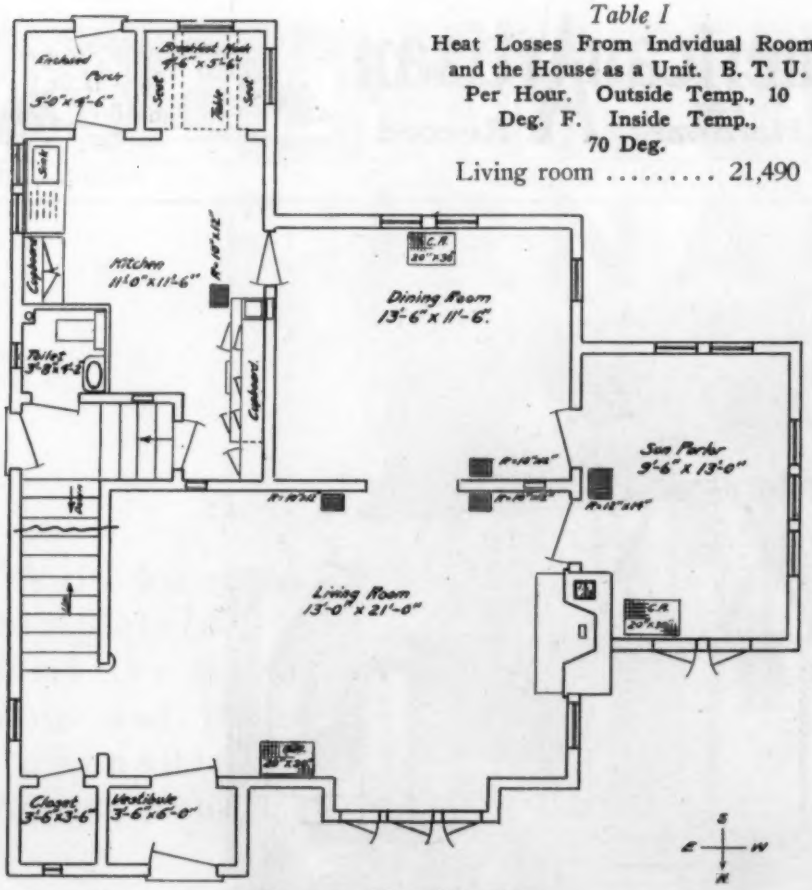


Figure 2. First Floor Plan

neighborhood of —20 deg. F. Consequently the furnace plant was designed on a basis of an outside temperature of —10 deg. F., with an inside temperature of 70 deg. F. at the breathing line five feet above the floors.

The lowest temperatures on record, in a locality, may be of only a very short period of duration. Any plant design based on the extreme lowest temperature of a period of years previous will result in too large a heating unit for the greatest part of the heating season. A rational basis of design is to calculate the plant size using an outside temperature 10 deg. F. higher than the lowest temperature on record for the locality in which the plant is to be installed. On this basis the following heat losses for the various rooms of the house have been computed. The coefficients of heat transmission were calculated for the walls, etc., from known data for the materials used. The heat losses given in Table I allow for the effect of a wind at 15 miles per hour velocity.

Table I

Heat Losses From Indvidual Rooms and the House as a Unit. B. T. U. Per Hour. Outside Temp., 10 Deg. F. Inside Temp., 70 Deg.

Living room	21,490
Sun parlor	14,575
Dining room	7,850
Kitchen and breakfast nook	16,170
Bath room	3,375
Bed room 1	6,470
Bed room 2	9,250
Bed room 3	7,060
House as a unit with allowances for air leakage	82,680

It will be noted that bed rooms 2 and 3 are shown on the floor plan, Fig. 3, as having the same dimensions. The reason for the greater calculated heat loss from room 2 is due to the fact that this room has more glass area and more linear feet of cracks about the glass. These increase the amount of heat lost through the glass by air inleakage.

Leader Pipe Sizes

Calculations to determine the sizes of the leader pipes necessary to supply heat to the various rooms were made by two methods:

Method number one: The heat carrying capacities in B. t. u. per square inch of cross section of leader pipe as given in University of Illinois Engineering Experiment Station Bulletin Number 141, Investigation of Warm Air Furnaces and Heating Systems, by Professors

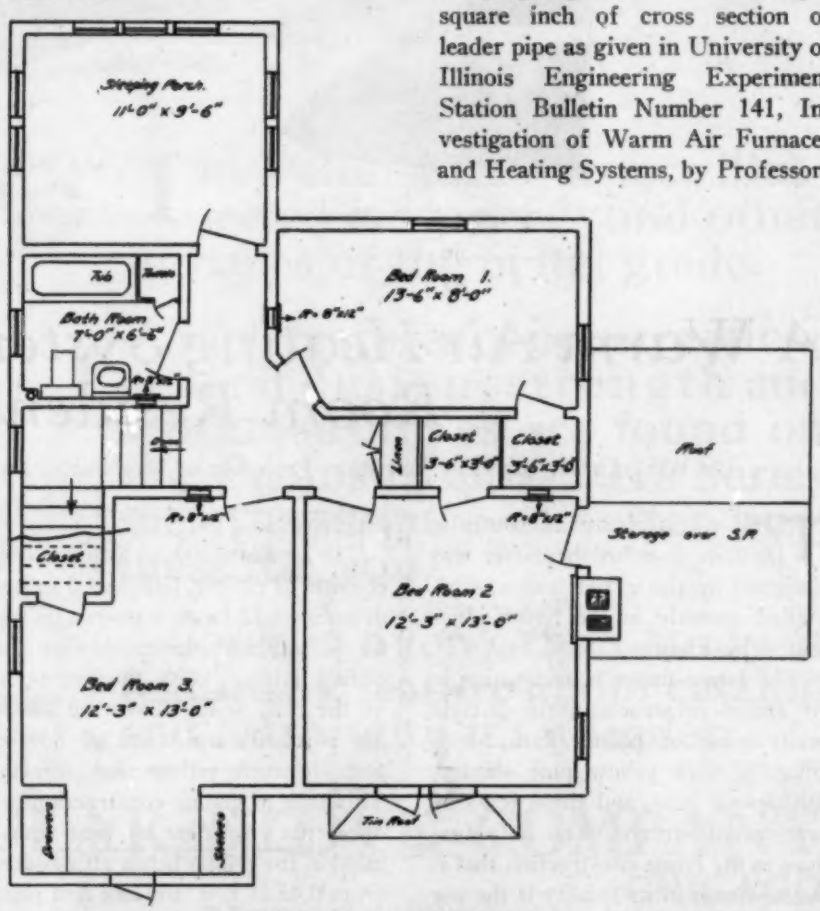


Figure 3. Second Floor Plan

A. C. Willard, A. P. Kratz, and V. S. Day, were used. The heat carrying capacity per square inch of leader pipe is given in the above bulletin as 103 B. t. u. for first floor rooms and 170 B. t. u. for second floor rooms, when the temperature of the air leaving the registers is 175 deg. F. and the temperature of the air entering the recirculating ducts is 65 deg. F. The required leader area for a room was found by dividing the heat loss from the room by 103 for first floor rooms and by 170 for second floor rooms.

A register temperature above 175 deg. F. is not advisable in warm air furnace systems. It is far more satisfactory from the standpoint of the comfort of the house occupants to circulate a larger volume of air at 175 deg. F. or less register temperature, than it is to handle a smaller quantity of air at register temperatures above 175 deg. F. as in "hot air" systems.

Method number two: The calculations for this method were based on the Standard Code formulated by The National Warm Air Heating and Ventilating Association. The leader areas by the Standard Code are computed by using the volumes of the rooms, the net outside wall areas, and the glass areas, together with recommended divisors and multipliers. The leader areas obtained are set forth in Table II together with the leader areas and diameters actually installed.

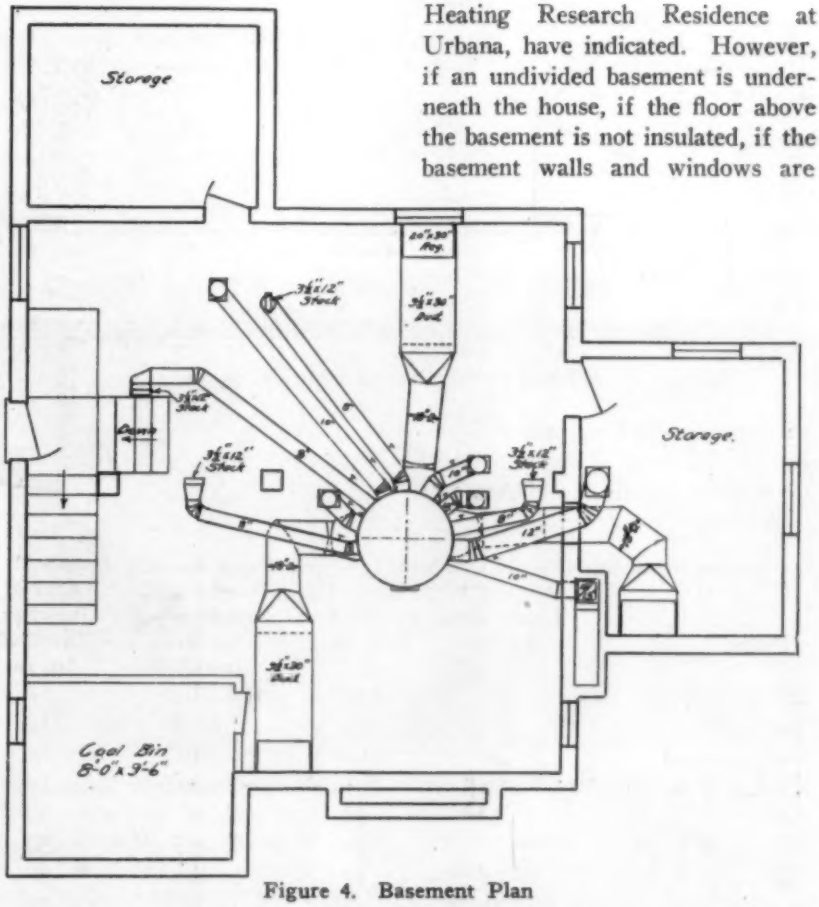


Figure 4. Basement Plan

The leader sizes calculated by the two methods compare favorably for second floor rooms. There is, however, a greater variation in the calculated sizes for the first floor leaders. The heat carrying capacity used in method one for first floor leaders is a correct value for the register temperature selected as tests, in the National Warm Air Heating Research Residence at Urbana, have indicated. However, if an undivided basement is underneath the house, if the floor above the basement is not insulated, if the basement walls and windows are reasonably tight, and if a small part of the basement walls are exposed to the outside air, a part of the heat lost from the furnace casing and the leaders in the basement may be expected to pass to the first floor of the house. Under such conditions the first floor leader areas may be reduced somewhat. In this case the leader areas obtained by the Standard Code seemed ample and were installed, as near as was possible with the commercial sizes of leader pipe available. The total leader areas installed for the interconnected living room, dining room and sun parlor equal the calculated total areas by the Code. The distribution of the leader areas to the rooms is slightly different than calculated due to the fact that commercial pipe was used. This is not of serious consequence as all the registers serving the three rooms are close together and the rooms are interconnected.

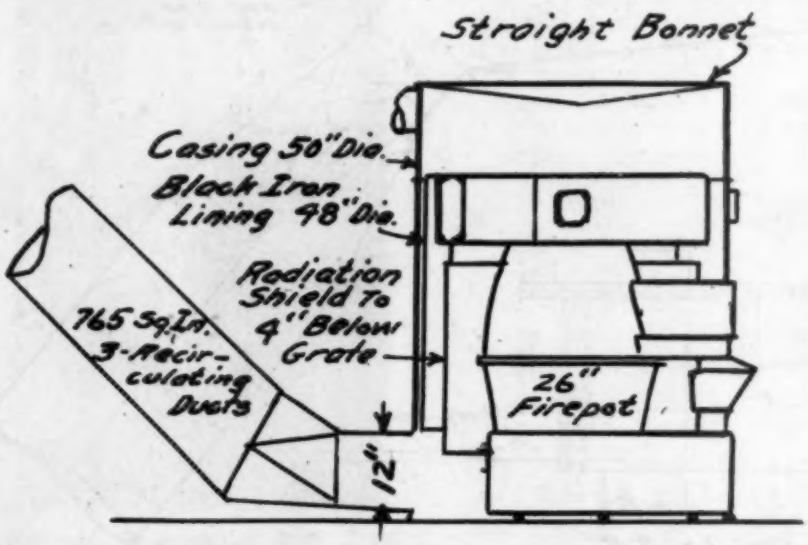


Figure 5. Section Through the Furnace and Casing

The kitchen was provided with one 10 inch leader about 12 feet in length. This leader has 78.5 sq. in.

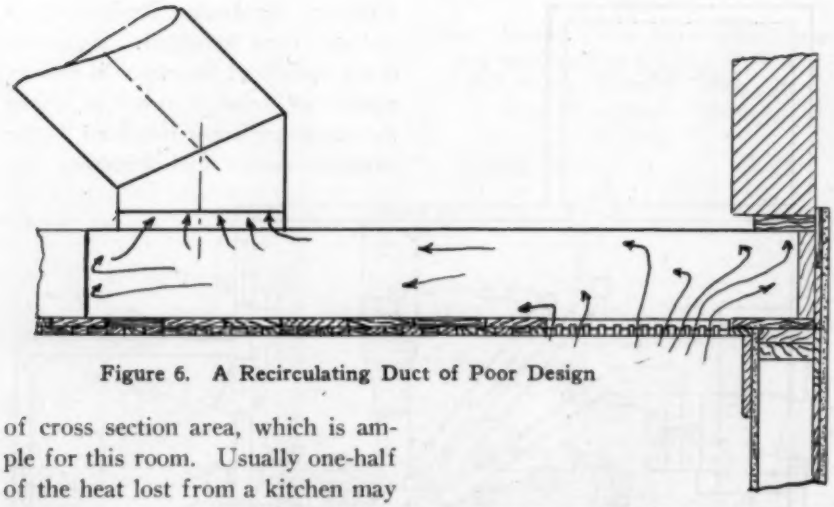


Figure 6. A Recirculating Duct of Poor Design

of cross section area, which is ample for this room. Usually one-half of the heat lost from a kitchen may be counted upon to be supplied by the kitchen range.

Table II

Leader Areas by Methods One and Two, and Those Actually Installed

Room	Method 1 Leader Area Sq. In.	Method 2 Leader Area Sq. In.	Number and Diameter of Leaders Installed	Area of Leaders Installed Sq. In.
Living room.....	209	179	2—10″	157
Sun parlor.....	141	100	1—12″	113
Dining room.....	76	60	1—10″	78.5
Kitchen & B. N.....	156.5	105	1—10″	78.5
Bath	22	13	1—8″	50
Bed room 1.....	38	31	1—8″	50
Bed room 2.....	54	47	1—8″	50
Bed room 3.....	41	41	1—8″	50

It is not practical to use leader pipes smaller than 8 inches in diameter, due to the heat and friction losses existing in pipes of smaller sizes. All second floor registers are served by 8 inch leaders and 3½ by 12 inch single wall stacks. The stacks are slightly larger than the minimum sizes established by the Standard Code for 8 inch leaders. The ratio of stack area to leader area is $42 \div 50 = 0.84$, which is satisfactory in walls built with 2 by 4 inch studding. All leaders to stacks are joined to the stack by swage type boots which gradually change from round to a rectangular section. These boots reduce the friction and air turbulence losses in the stack connections.

All leaders were left uncovered except at the pipe joints. These were covered with a single thickness of 2 inch strips of asbestos paper. Tests made during the Warm Air Furnace Research Investigation at the University of Illinois, have shown that light insulation on the leader pipes, such as one thickness of asbestos paper, is worse than no insulation at all.

Calculation of Furnace Size

The furnace size was based on the use of coal of 10,000 B. t. u.

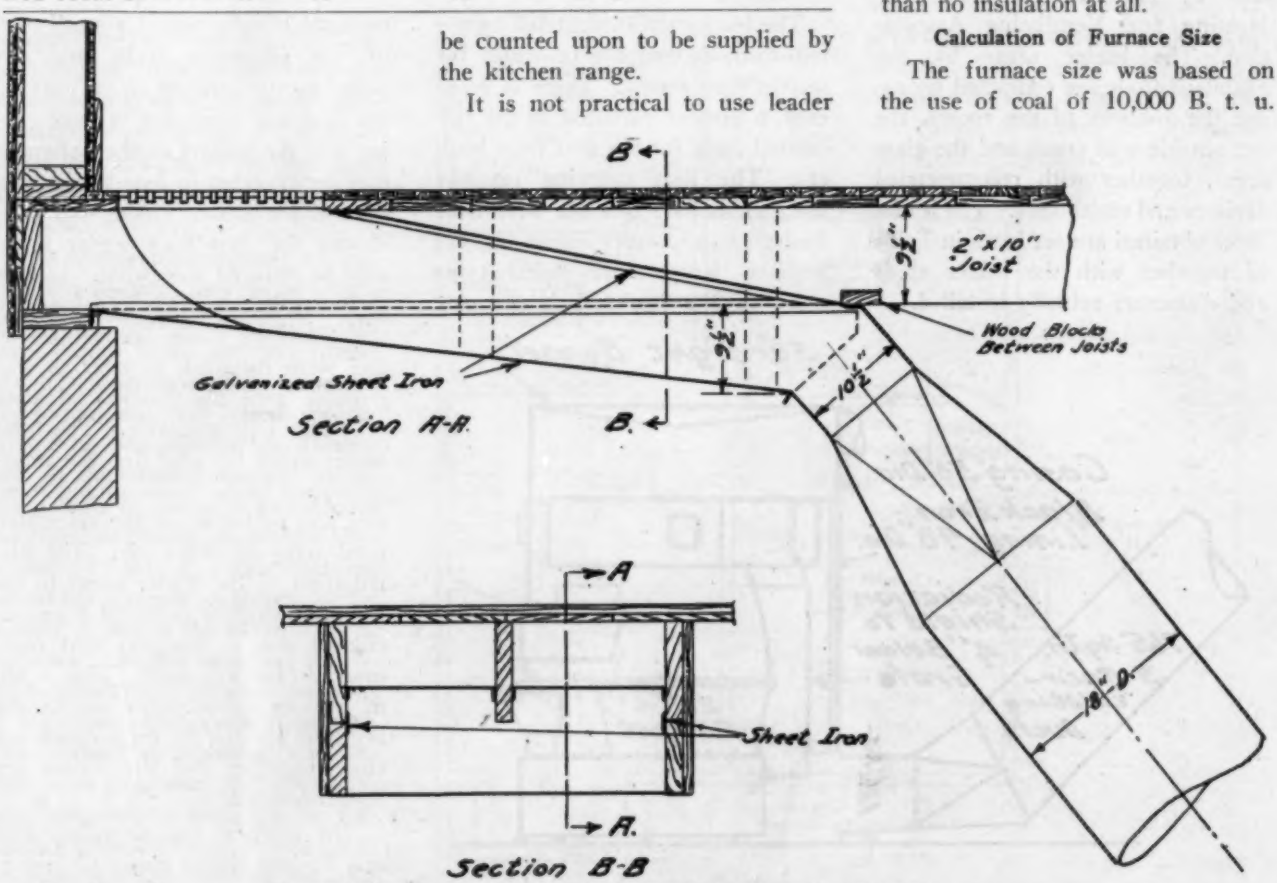


Figure 7. Sections of the Recirculating Ducts as Installed

per pound as fired, a furnace efficiency of 57.5 per cent and a combustion rate of 7.5 lb. of fuel per square foot of grate surface, per hour.

The weight of air to be handled by the system as necessary to supply 82,680 B. t. u. per hour, at a register temperature of 175 deg. F., is expressed by the following equation.

$$W_a = \frac{H}{C_p (t_d - t_r)}$$

W_a = Weight of air handled per hour, lb.
H = Heat loss to be supplied, B. t. u. per hr. = 82,680
C_p = Specific heat of air, B. t. u. per lb. = 0.24
t_d = Register temperature, deg. F. = 175
t_r = Temperature of the room, deg. F. = 70

$$W_a = \frac{82{,}680}{0.24\ (175 - 70)} = 3{,}280 \text{ pounds of air per hour.}$$

The furnace will be required to supply not only the heat losses from the rooms but also the heat losses between the furnace bonnet and the rooms to be heated. The total heat that the furnace must supply is arrived at by an allowance for the drop in the temperature between the furnace bonnet and the registers. This temperature drop may be taken as averaging 30 deg. F. in most installations. The heat that the furnace must deliver at the bonnet is expressed as:

$H_f = W_a \times C_p (t_b - t_e)$
H_f = Heat at the furnace bonnet, B. t. u. per hr.
W_a = Weight of air handled per hour, lb. = 3,280
C_p = Specific heat of air, B. t. u. per lb. = 0.24
t_b = Air temperature at bonnet, deg. F. = 175 + 30 = 205
t_e = Temperature of the recirculated air, deg. F. = 65

$H_f = 3{,}280 \times 0.24\ (205 - 65) = 110{,}000$ B. t. u. per hour.

The furnace grate area required under the conditions of furnace operation selected is:

$$G = \frac{H_f}{C \times R \times E}$$

G = Grate area, sq. ft.
H_f = Heat supplied by the furnace, B. t. u. per hr. = 110,000
C = Heat value of the fuel, B. t. u. per lb. = 10,000
R = Combustion rate, lb. of fuel per sq. ft. of grate surface, per hr. = 7.5
E = Furnace efficiency = 0.575

$$G = \frac{110{,}000}{10{,}000 \times 7.5 \times 0.575} = 2.56 \text{ sq. ft. or } 368 \text{ sq. in.}$$

This corresponds to a grate 22 inches in diameter. Furnaces are rated on the maximum diameter of the fire pot, which is usually 4 inches more than the grate diameter.

The furnace size selected was 22 + 4 = 26 inch furnace.

This furnace is served by a tile lined chimney 11¼ x 11¼ inches inside and 37½ ft. high above the grate.

A section of the furnace is illustrated by Fig. 5. The furnace is fitted with a galvanized sheet iron casing 50 inches in diameter. The casing is lined with black sheet iron from the grate level to the bottom of the bonnet. The lining is spaced uniformly one inch from the casing. A radiation shield is hung from just beneath the radiator ring and extends a distance of 4 inches below the grate level. The three cold air shoe openings at the bottom of the furnace casing are ample in size so that the radiation shield does not block the incoming air. The radiation shield does, however, somewhat prevent the incoming air from being warmed in the recirculating duct shoes. The radiation shield and furnace lining give four additional surfaces for the air to pass over and absorb heat. The purpose of the shield and the lining is to prevent or lessen the loss of heat from the furnace to the basement.

The furnace bonnet used is of the straight side type with a concave top. Leader connections were taken from the bonnet sides as joist bearers across the basement will not permit the leaders to be taken out of the top of the bonnet.

Figure 8. Transformation From Rectangular to Round Section In a Duct

Figure 9. Recirculating Duct From the Living Room

Recirculating Ducts

Due to the arrangement of the house, a single recirculating duct was not feasible. Three recirculating ducts and cold air registers were

located and installed as shown by Figures 2 and 4. The duct leading from the register near the front door should handle the air inleakage at the front entrance and also the air returned down the stairway from the second floor. The recirculating duct registers located in the sun parlor and dining room were placed in the floor beneath windows. The object of these locations was to pass the cold air leakage at the windows quickly to the furnace casing.

As the recirculating duct register positions necessitated somewhat long and crooked ducts, the air velocity allowable in them was taken at a conservative figure of 2.5 feet per second for design purposes.

The total required area in the recirculating ducts was computed as:

$$A = \frac{W_s}{d \times T \times V}$$

A = Duct area, sq. ft.
W_s = Weight of air handled per hr., lb., = 3280
d = Weight of 1 cu. ft. of air at 65 deg. F., lb. = 0.0757
T = Seconds per hour = 60 × 60 = 3600
V = Velocity in the duct, ft. per second = 2.5

$$A = \frac{3280}{0.0757 \times 3600 \times 2.5} = 4.83 \text{ sq. ft.}$$

The required area per duct was equal to 4.83 ÷ 3 = 1.61 sq. ft. or 232 sq. in. Eighteen inch circular ducts having a cross section of 254 sq. in. were selected as the nearest commercial sizes. The air velocity in these ducts will be less than 2.5 feet per second when the system is in operation.

Although the height of the basement from the floor to the under side of the overhead joists is 7 ft. 3 in., it was necessary to partially carry the recirculating ducts, from the registers toward the furnace, between the floor joists. A recirculating duct carried entirely beneath the floor joists would have reduced the basement head room too much, had it been given the proper pitch.

Figure 6 shows a common method of carrying a recirculating duct between floor joists. The method illustrated by Fig. 6 represents very poor practice for several reasons. These are:

(a) The duct cannot be given any pitch downward toward the furnace.

(b) Bridging between the floor joists offers obstructions to air flow.

(c) Friction losses of the air moving over the surfaces of the middle joists in the duct are large.

(d) A great amount of turbulence exists in the air flow as the air enters and leaves the ducts.

The head or motive force producing air flow in a warm air furnace system is very small. Any or all of the above losses may reduce the amount of air flowing in the system. The effect of the smaller quantity of air will generally be a smaller amount of furnace heating capacity. Cases exist where the designs of the recirculating ducts have cut the furnace capacity to almost nothing. Invariably in such cases the castings of the furnace deteriorate very rapidly and are soon burned out.

A combination of rectangular and circular ducts was used in this design. The construction of the rectangular parts of the ducts is shown by Fig. 7. Pieces of 2 in. x 10 in. yellow pine 6 to 7 ft. long were split diagonally and fastened by cleats to the under side of two floor joists 32 in. center to center. The cracks between these pieces and the joists above were covered with sheet metal to prevent air inleakage. These pieces form a part of the sides of the rectangular duct and give a pitch downward toward the furnace. The bridging was removed from between the floor joists used for the duct and 2 in. x 4 in. nailing blocks fastened between the joists as shown in Fig. 7. Sheets of galvanized iron were cut and the edges were turned down. These were nailed between the joists as shown in Fig. 7. The sheets just described extend from the front side of the cold air register to the nailing blocks. The purpose of these sheets is to prevent turbulent conditions in the duct and also to prevent base-

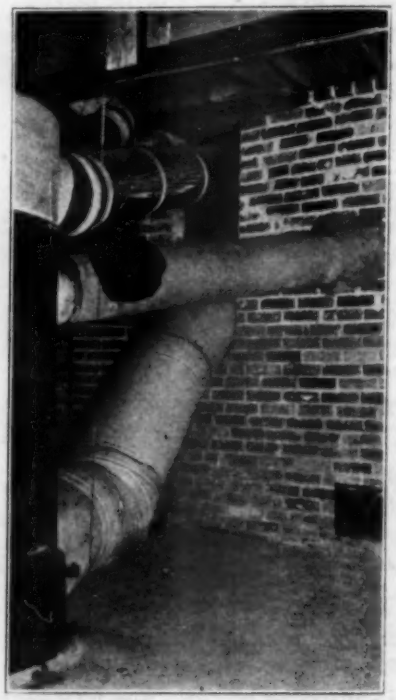


Figure 10. Sun Parlor Leader Pipe and Recirculating Duct

Figure 11. Recirculating Duct Shoes

ment air from being drawn into the duct through cracks between boards of the sub-flooring. The bottom of the duct was covered by a sheet of galvanized iron nailed to the under side of the wooden side walls. Deflectors of sheet iron were placed between the joists at the rear of the cold air registers to properly guide the air into the duct at this point (Fig. 7). The cross section area of the rectangular ducts is not reduced to less than 30 in. x 9.5 in. = 285 sq. in. A view of the rectangular sections as actually constructed is shown by Fig. 8.

At the suggestion of Professor A. C. Willard, the connections of the rectangular to the circular ducts were made out of the ends of the rectangular ducts. Special transition pieces changing from a rectangular section 10.5 x 30 inches to a circular section 18 inches in diameter were made. (Figures 7, 8 and 9.) The transition pieces were fastened to the nailing blocks, the wooden side walls and the metal bottoms of the rectangular ducts. The object of these transition pieces is to reduce the friction and the turbulence losses of the air as it enters the circular parts of the ducts. The transition pieces and the circular ducts pitch downward toward the furnace at angles between 45 and 60 degrees with the horizontal.

The method of carrying these ducts toward the furnace is shown by Figures 9 and 10. Figure 10 also illustrates how the recirculating duct and the warm air leader pipe of the sun parlor were carried through a brick wall. The recirculating ducts were turned toward the bottom of the furnace casing by easy bends and special elbows of angles between 45 and 60 degrees.

The cold air ducts were joined to the bottom of the furnace casing by special shoes as shown by Figure 11. These shoes are simply transition pieces changing an 18-inch round duct to a rectangular duct 12 in. x 24 in. Care was taken that the duct openings into the furnace casing did not extend above the grate level. Recirculating duct shoe openings above the grate level of the furnace allow radiant heat from the furnace to be thrown into ducts, warming their walls. These walls then give up heat to the air passing to the furnace and the capacity of the furnace system is reduced, due to the smaller weight of air handled per hour. The minimum duct areas occur in the circular portions of the ducts and these are greater than the calculated requirements.

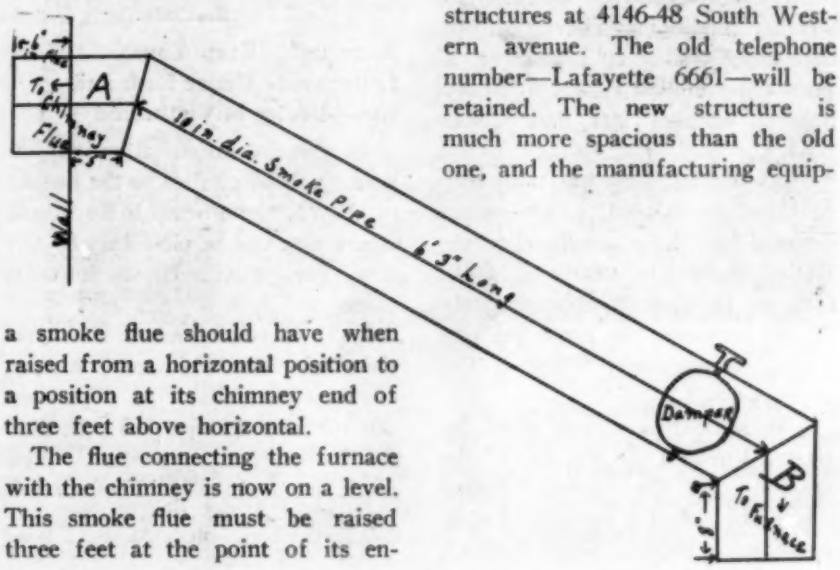
The object of all this design has been to move the air with small friction and other losses and thus secure the maximum capacity of the furnace.

The additional cost of these special features amounts to about 20 to 25 per cent of the cost of the furnace system without them. The total cost of this special furnace installation is very much less than the cost of either a steam or hot water plant of equal heating capacity, and the features involving the additional expenditures are well worth the money in rapid and satisfactory heating performance.

It is the expectation of the writer to take data of the operation of this furnace during the coming winter, the results of which will be published at some future time.

George Streibe Wants to Determine Angle of Elevation on Flue Connection

George Streibe, 46 Ashford Avenue, West View, Pittsburgh, Pennsylvania, is confronted with a problem of finding the angle of elevation



a smoke flue should have when raised from a horizontal position to a position at its chimney end of three feet above horizontal.

The flue connecting the furnace with the chimney is now on a level. This smoke flue must be raised three feet at the point of its entrance into the chimney. How can the correct angle of the two elbows be determined?

The flue is ten inches in diameter. It projects into the chimney opening six inches, and the bend in the chimney elbow comes five inches from the wall. The length of the flue itself is six feet three inches. It projects eight inches vertically from the furnace before the bend in the furnace elbow comes.

L. R. Hamman Wants Data on Garage and Ventilating Heating Equipment

To AMERICAN ARTISAN:

There is a demand here for warm air heating plants, fan drivers, using metal trunk lines to distribute the heat.

I shall be pleased to hear from manufacturers who make furnaces and equipment for heating garages and large buildings. I should also like to get some data on the proper ventilation for garages and office buildings.

Yours very truly,
L. R. Hamman.
507 E. Prairie Ave., Decatur, Ill.

Herbert H. Davis Co., Chicago, Moves to New and Larger Quarters

Herbert H. Davis Co., Inc., ventilating contractors and engineers formerly located at 3022 Archer Avenue, Chicago, have moved their offices and factory to their new structures at 4146-48 South Western avenue. The old telephone number—Lafayette 6661—will be retained. The new structure is much more spacious than the old one, and the manufacturing equip-

ment that has been installed is of the most up-to-date type.

J. Paul Reinhardt Thinks Warm Air Trunk Line System Is Effective

To AMERICAN ARTISAN:

I believe that the layout by R. W. Menk, of Heating Systems and Supply Co., will encourage many timid installers to use the trunk system, especially if the owners are willing to pay enough for the work to justify the use of a fan. But even with a gravity system a well-proportioned trunk line system is effective and does away with the large number of leader pipes, where a well-built basement lends itself to the purposes.

The blue cover you had on the issue of October 23 was a pleasant diversion.

J. PAUL REINHARDT.
Farris Furnace Co.

Sears-Roebuck and Ward & Co. Sales Decline During October

Whether because of a lower purchasing power in the agricultural districts or different weather conditions, October sales of Chicago's two big mail order houses were less than a year ago. It was the first decline, as compared with the same month of the preceding year, that has occurred in many months.

Officials of both Sears, Roebuck & Co. and Montgomery Ward & Co. are inclined to attribute the present comparative decline to weather conditions. They point out that unseasonably cold weather a year ago stimulated sales in heavy apparel, whereas last month was mild.

"October last year was unusually cold and occasioned a pre-season demand for winter merchandise, resulting in sales of nearly $22,000,000, an increase of approximately 27 per cent over the preceding October," Montgomery Ward & Co. say.

The same reason was given by Sears, Roebuck & Co., with the opinion that the current decline "does not reflect a permanent state of affairs." Sales of Sears-Roebuck last month were $26,839,503, a decline of $3,535,102, or 11.6 per cent, from October, 1925. Sales for the ten months this year totaled $214,725,261, an increase of $12,728,653, or 6.3 per cent, over the same period last year. Sales of Montgomery Ward last month were $20,154,626, a decline of $1,810,256, or 8.24 per cent, from October, 1925. Sales for the ten months this year totaled $156,281,323, an increase of $13,768,705, or 9.66 per cent, over the same period last year.

Warm Air Furnace Fan Company to Offer Course In Heating

The Warm Air Furnace Fan Company of Cleveland has inaugurated under the guidance of their Mr. J. C. Miles a two months' intensive course for young college graduates in scientific principles of warm air heating.

These young men will be trained in engineering, designing, installation and salesmanship, fitting them for the position of sales engineers. Upon completion of the course they will be turned over to furnace manufacturers who desire trained men capable of designing or engineering any intricate problem of warm air heating, as well as competent to show the dealer how this work can be done.

It is suggested to manufacturers desiring such men that they make application to Warm Air Furnace Fan Company, giving date wanted.

Warning!! Keep Your Letterheads Under Lock and Key—Dealer Is Victimized

In these columns attention has been repeatedly called to the danger of allowing letterheads to lie around where they can be picked up by any stray person who comes into the office.

E. P. Hayes, Manager of Advertising, the Fox Furnace Company, Elyria, Ohio, tells of an experience one of their dealers, J. L. Denison & Company, Amsterdam, New York, has had. The information is passed on as a warning to others.

The letter from J. L. Denison & Company to the Fox Furnace Company reads as follows:

"On Friday, the 22nd, a man came to our office representing himself as your advertising manager. He stated that you were starting a new advertising campaign, to be conducted direct through the people handling your cabinet heaters and warm air furnaces.

"He stated that he would send on some circulars of suitable size that we could mail out in our regular small size envelopes; he also requested that we give him a letterhead and envelope as a sample so that he could have new ones printed with a cut of your Cabinet heater and warm air furnace on same, and if same were satisfactory to us after they were submitted for our approval, that your firm would furnish the stationery to us free of charge for the purpose of advertising your goods.

"A matter has come to our attention which causes us to write you to inquire whether or not you have such an authorized representative in this territory. We gave this man a letterhead and envelope which he took with him. On Tuesday, the 25th, we received an invoice from J. M. Warren & Company, of Troy, New York, for 301 pounds solder at 45 cents, amounting to $135.45; this we returned to them with notation that we did not order, receive or know anything about it and stated that it must have been sent to us in error.

"Warren & Company then telephoned us that they had on file a written order calling for this material and that same had been delivered to bearer of order on Saturday, the 23rd. We asked that they return the order to us so that we could trace it, as our records showed no order having been sent out. They returned the order to us and it appears to be the letterhead and envelope which we gave to the man representing your company as your advertising manager.

"This appears to be a plain case of forgery and of obtaining goods under false pretense."

SIGNED.

The Editor's Page

President Coolidge Says Advertising Is Basis of Industrial Expansion

PRESIDENT COOLIDGE had a very important message to give the American Association of Advertisers in convention at Washington last week. What he said about advertising can be read with profit by advertisers in both the warm air heating and sheet metal industries.

"When we stop to consider the part which advertising plays in the modern life of production and trade we see that basically it is that of education. It informs its readers of the existence and nature of commodities by explaining the advantages to be derived from their use and creates for them a wider demand. It makes new thoughts, new desires, and new actions favorable to the man in business.

"By changing the attitude of mind it changes the material condition of the people. Somewhere I have seen ascribed to Abraham Lincoln the statement that 'In this and like communities public sentiment is everything. With public sentiment nothing can fail; without it nothing can succeed; consequently he who molds public sentiment goes deeper than he who enacts statutes or pronounces decisions. He makes statutes and decisions possible or impossible to be executed.'

Advertising creates and changes this foundation of all popular action, public sentiment, or public opinion. It is the most potent influence in adopting and changing the habits and modes of life, affecting what we eat, what we wear, and the work and play of the whole Nation. Formerly it was an axiom that competition was the life of trade. Under the methods of the present day it would seem to be more appropriate to say that advertising is the life of trade.

"Two examples of this influence have come to me in a casual way. While I cannot vouch for the details, I believe in their outline at least they are substantially correct.

"One relates to an American industry that had rather phenomenal growth and prosperity in the late eighties and early nineties, being the foundation of one or two large fortunes. In its development it had been a most generous advertiser. A time came when various concerns engaged in this line of manufacturing were merged and consolidated. There being no longer any keen competition, it was felt that it was now no longer necessary to explain to the public the value of this product or the superiority of one make over another. They had the fieild to themselves.

"In order to save the large expense that had been made for that purpose, advertising was substantially abandoned. The inevitable result followed, which all well-informed trade quarters now know would follow. But the value of advertising was not so well understood 25 or 30 years ago. This concern soon became almost a complete failure.

"As I recall, it had to be reorganized, entailing great losses. This line of trade was later revived under the direction and counsel of some of its old managers, and with the proper amount of publicity became a successful enterprise flourishing even more heartily than it had before.

"The system which brought about these results is well known to the members of this association. You have seen innumerable instances where concerns have failed through lack of advertising and innumerable others where they have made a success through the right kind and amount of publicity.

"Under its stimulation the country has gone from the old hand methods of production which were so slow and laborious with high unit costs and low wages to our present great factory system and its mass production with the astonishing result of low unit cost and high wages.

"The preeminence of America in industry, which has constantly brought about a reduction of costs, has come very largely through mass production. Mass production is only possible where there is mass demand. Mass demand has been created almost entirely through the development of advertising, and to advertising we must look to maintain this mass demand."

It will be agreed that President Coolidge has said nothing new to business men who know sound business practice.

However, there are still too many men who are making only moderate successes of their businesses, because they still regard advertising as a necessary evil, to be pruned as soon as business begins to drop off.

There is no substitute for advertising to produce a steady, healthy expansion in business. But to be beneficial the advertising must be consistent. Intermittent splurges can never produce the results that will be gained by a steady program that increases in proportion as the business increases.

Advertising appropriations should be the last to suffer from the pruning knife. If you have doubts about the authenticity of this statement, analyze the practices of some of the business failures. Invariably you will find that curtailment of advertising at a critical period was one of the outstanding factors contributing to the downfall of the business.

The product must be kept constantly before the possible customer. Changing conditions are constantly bringing new people into the circle of possible users of the product. These people must be educated into the use of that product and there is no more economical way of doing this than by advertising.

Random Notes and Sketches
By Sidney Arnold

"The essence of humor is sensibility; warm, tender fellow-feeling with all forms of existence."—Carlyle.

Early Monday morning of this week I had the pleasure of a visit with Mr. G. E. Robinson, sales manager of The A. H. Robinson Co., Cleveland, Ohio. Mr. Robinson was on his way through Chicago to Nebraska. From there he will continue on to South Dakota, North Dakota, cutting over to Minnesota before returning to Cleveland. Mr. Robinson is looking fine.

* * *

A move to give delivery horses three weeks' summer vacation without stopping their oats has been started in Berlin. This may do very well in Germany, but American horses, owing to motor competition, are not sure enough of their jobs to strike for privileges.—*Chicago Daily News.*

* * *

I received a communication from R. S. (Tommy) Thompson, Indianapolis, who travels for the Mt. Vernon Furnace & Manufacturing Company, one day this week. Tommy was paying up his subscription to AMERICAN ARTISAN, because he feared that our circulation department might not like it a little bit if he should send a letter to us something similar to the one he ran across from a dealer in answer to the correspondence of a certain credit man:

"Dear Company:

"I got your letter about which I owe you. Now be pachunt. I ain't forget you. Please wait. When sum fools pay me I pay you. If this wuz judgment day and you wuz no more prepared to meet your maker as I am to meet your account, you sure would have to go to hell. Trust you will do this. I am, very truly."

In the next breath, so to speak, Tommy tells about a bright Indianapolis school child who wrote in response to the request of the teacher for a sentence containing the word "Diadem": "People that drive their automobiles on railroad tracks without looking diadem sight sooner than those that look."

* * *

A young woman with aspirations to be a singer and, as is so often the case, little else, went to a German vocal teacher for a tryout before arranging to take lessons. The professor sat down and played a selection while the budding but ambitious singer poured out her choicest assortment of notes. When all was over the professor swung around on his stool and in wrathful voice said:

"Ach! Never have I heard such a voice! I blay on der vite keys und I blay on der black keys, but you sing in der cracks!"

* * *

"And you had the nerve to tell me that while I was away with the children you spent every night home—working!"

"But, my dear, of course I did!"

"Oh, you did? Then how about this electric light bill of only fifty cents for the two months?"

* * *

A Valued Employee

Arthur P. Lamneck (to applicant): I am inclined to give you the position if you understand double-entry keeping.

Applicant: I do, indeed! At my last place I had to do a triple-double-entry—a set for the active partner, showing the real profits, a set for the sleeping partner, showing small profits and a set for the Income Tax officials, showing no profits.

* * *

Scat and Scamper

Ed Merrick, Louisville, was overtaken by darkness in the backwoods of Kentucky and was forced to spend the night in the cabin of a grizzled mountaineer.

Sitting before the fire after a simple supper Ed noticed the place of honor occupied by an old cat and five kittens. Feeling a draft he also noticed that the door of the cabin was cut for six cat holes, one large one and five small ones, with three of the small ones in a sort of second story arrangement.

"Friend," he said, wasn't it foolish to cut more than one hole in the door for your cats?"

"Naw," said the mountaineer, "you don't know me. I'm high tempered, and when I say 'scat' I mean scat."

* * *

The Young Safety Inspector

Oh, Dad, come look at all this junk! I'll say this room looks pretty punk. The basement floor is far from neat and rusty nails cause punctured feet. Someone might fall and maybe break an arm or leg if he should take a tumble on these empty cans left lying here by careless hands.

Here's turpentine and gasoline, varnish, paint and kerosene, old underwear and greasy rags; waste paper, too, and empty bags. If fire should start in all this trash, the house would go in one big flash. Our teacher says that fires don't start when everybody does his part and lends a hand in keeping clean the places that are seldom seen—in attics, basements, closets dark, where rubbish waits for just a spark to start a blaze that may destroy the happy home we now enjoy. If we don't clean it *up*, no doubt, a fire may come and clean us *out*.—*International News.*

* * *

Father: "I never kissed a girl until I met your mother. Will you be able to say the same to your son when you become a married man?"

Son: "Not with such a straight face as you can, father."

* * *

Red-hot Steno: "I wouldn't even consider marrying you. You are the most stupid, asinine, idiotic creature on earth. You are repulsive, abhorrent and miserable. I wouldn't marry you if you were the last man on earth. I hate you. You are despicable."

Suitor: "Do I understand that you are rejecting my proposal?"

—*Tri State Bulletin.*

A Study in Oxy-Acetylene Welding for General Shop Work

Correct Operation of Welding Machine Requires Skill Gained by Experience

By O. W. Kothe, Principal St. Louis Technical Institute

THE mechanical operation of welding is a great deal like working metal; that is, the mechanic must know what metal will stand—how much it can be bent or abused before it fails. So, too, a person riveting must know how far to set a rivet so that it will not bruise the metal itself or become flattened to a point where its holding power is impaired. After he has made sufficient experiments, the workman learns these things.

In welding similar facts must be learned; that is, the handling of the torch, the correct flame, the color of the metal just before fusing or melting, and how to build up a joint so that the welding rod and the metal itself will be properly fused or welded.

These bits of knowledge are also learned by practice.

Much experimenting is necessary on different kinds of metal, and each metal, as cast iron, steel, copper, aluminum, etc., requires its own handling. In the welding business there must be a great deal of experimenting on a person's own time in order not to ruin someone else's work and so prove more costly than the price of experimenting.

The big aim of the sheet metal worker today must be ever to render an ever wider scope of service, thus maintaining steady work over and above the general average. It's a business proposition with the worker, as it is with the employer to extend his avenues of income. The tens of millions of workers are satisfied to just get a living out of their work—that is, they refuse to learn more until they are paid more and also paid for the learning. It is only the exception of these masses who steps out by himself and makes his work his business as well as a better living.

While experimenting with the welding torch, the welder must especially observe these things: First, to adjust properly the flow of gases through the torch. At fig. 13 is shown an ordinary oxy-acetylene equipment set up for work. This is a line drawing from the Oxweld Acetylene Co. of New York and shows the acetylene tank, the oxygen cylinder, the gauges, hose and torch. In the previous article (page 110, American Artisan, October 16) I discussed the details for the regulator, gauges and torches. In this drawing, therefore, it is pertinent to mention that the hose is generally of two colors to avoid confusion. Black designates acetylene gas, and red, oxygen. This is to prevent interchanging when connecting the apparatus.

All hose connections must be made tight, using good clamps, and both hoses should be blown out now and then to free them from dust and dirt. When a leak occurs anywhere in the hose, close the tank valves and either repair the hose or secure a new one.

An acetylene leak is dangerous and if around the torch, it is liable to flare up and burn the operator *Leaks in tanks should never be repaired with a torch or anything hot,* but some soap should be plastered over the leak and then tightly wound with tape. Soap repairs should be considered only as temporary. When returning the cylinder to the manufacturer, the welder should tag it and write a letter to the firm telling them of the leak.

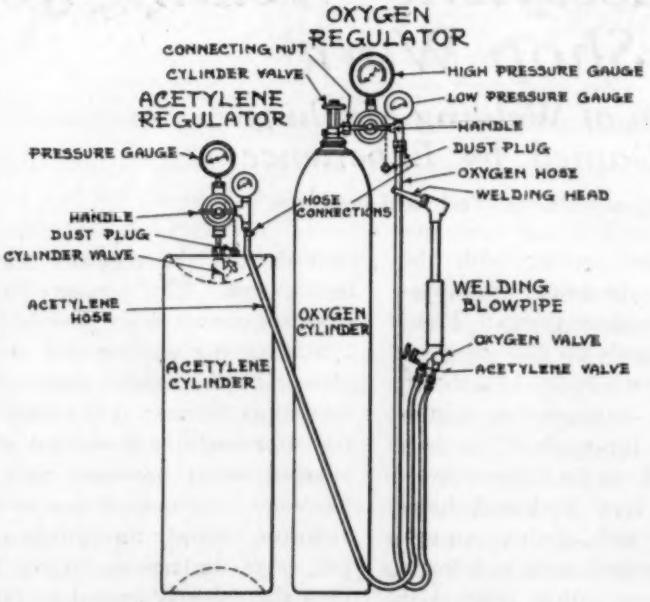
Each manufacturer of welding equipment has his own operating rules. His tank pressures are definitely his own. So the torch used should govern the pressure on the gauges, and by the size of the tip used and the tables furnished by the manufacturer the regulator should be adjusted. This pressure varies from six ounces to six pounds.

Starting the welding unit is explained by the oxweld and cutting manual as follows: On having the regulator and the hose and torch attached, it is necessary that we blow the hose out to remove dirt and dust. Slowly turn on the oxygen valve, by turning to the left, until the valve is opened as far as it will go. The pressure of the oxygen in the cylinder will show on the large gauge. If the cylinder is full, the gauge will read 100 per cent at 1,800 pounds. Then turn the hand screw of the regulator to the right until the oxygen passes through the hose. Keep turning the handle until a pressure of about 5 pounds shows on the small or low-pressure gauge. Let the oxygen pass through this hose for a few seconds; then turn the handle of the regulator to the left until the flow of oxygen stops.

Now slowly open on the head of the acetylene cylinder by means of the wrench supplied. *This valve should never be opened more than two full turns.* The pressure on the acetylene gauge will then show on the big gauge of 250 pounds when the cylinder is full. The hand screw of the regulator should then be turned to the right until a small amount of acetylene passes through the hose. Be sure no fire is near and allow the gas to flow through the hose until all dirt is removed, or about 5 seconds of time. Next turn the handle of the regulator to the left until the gas flow is stopped.

Lighting of Torch and the Flame Used

Always light the acetylene first and turn it off last, as this prevents what is often called "back-fire," or where the flame pops out. After



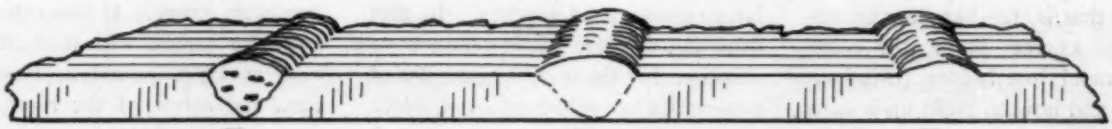
OXY-ACETYLENE WELDING UNIT
FIG. 13

A

NEUTRAL FLAME

B

FIG. 14 C



D E F

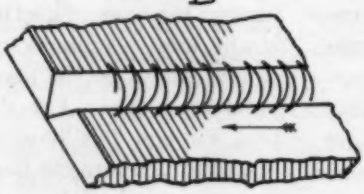


FIG. 15

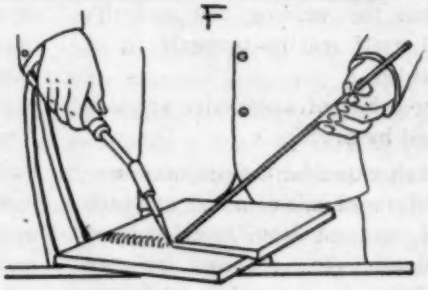


FIG. 16

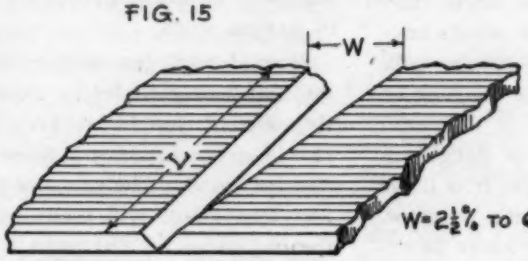


FIG. 17

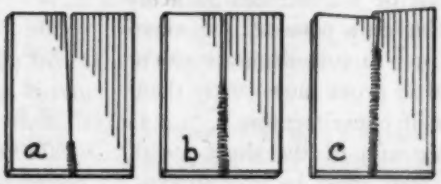
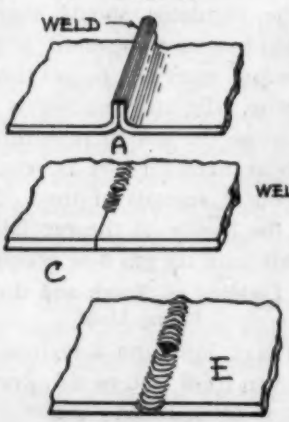


FIG. 18



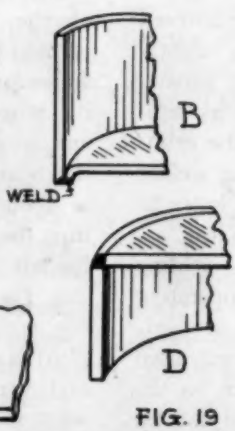
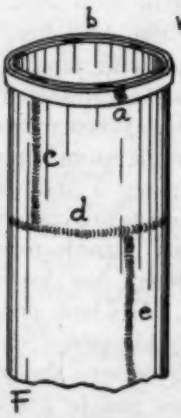


FIG. 19



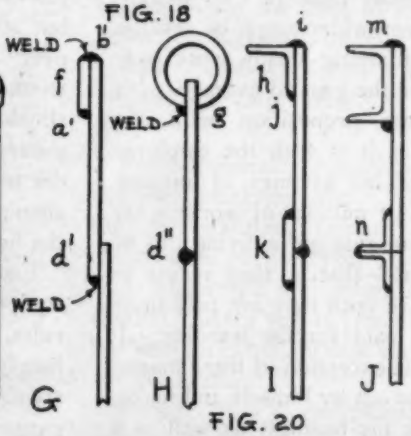


FIG. 20

the acetylene is lighted, turn on the oxygen valve slowly until you see clearly defined "central cone," bright bluish green in color, surrounded by a bushy, weak flame, purplish yellow in color. When too much oxygen is used, this central cone or jet becomes bluer in color and loses the greenish tinge; it is not so clearly defined.

When too much acetylene is used, the jet becomes bluish white and is streaky. Therefore the proper flame to use is where the central cone is sharpest and clearest, and this is known as the "neutral flame." The neutrality of the flame refers to the small welding flame only and indicates to the eye that the flame has just enough oxygen to burn the acetylene complete and no more. This is then the result where a correct proportion of the oxygen and acetylene is being consumed.

Thus at A of fig. 14 is shown an enlarged view of the neutral flame. The length is about three times the diameter of the largest part. The central portion, a, is sharp in outline and is symmetrical and smooth. A jagged or irregular flame indicates that the hole in the tip is not true or it is rough. This makes it necessary occasionally to run a drill of the exact size carefully into this end and to clean it out true. The thinner flame, b, is due to the burning of the hydrogen left when the acetylene is broken up into its constituents—carbon and hydrogen. That this flame is continuous in outline of both the inside flame, a, and the outside, b, it is characteristic of the torch used.

At B of fig. 14 we show the correct shape of the neutral flame in a more normal view. With oxy-acetylene this flame has a temperature of about 6,300 degrees F., while if oxygen-hydrogen gas is used a flame of about 4,100 degrees F is produced. When it is considered that the melting point of cast iron is about 2,100 degrees F., that of soft steel about 2,600 degrees F. and of wrought iron about 2,700 degrees F. it will be seen that there is no difficulty whatever in melting any of these metals.

By experimenting with the flame, as for instance in turning on an excess of acetylene, the neutral flame will entirely disappear. When the acetylene is reduced and the oxygen is increased; this flame decreases in size and becomes sharply defined. Upon a further increase of oxygen with no change in acetylene, this sharply defined neutral flame becomes somewhat shorter and takes on a violet tint, which indicates a surplus of oxygen in the flame itself. If the increase of oxygen continues, the flame will be blown out and hence the oxygen must be turned off.

While at work it is well to test the flame now and then. This is done by turning on a slight excess of acetylene, by means of the acetylene valve and then trimming it down, so that a neutral flame is produced. Under such conditions no one knows the exact amount of oxygen and acetylene consumed by any type or design of torch. Theoretically, one volume of oxygen is necessary in a torch to burn one volume of acetylene, both being pure. But since neither of these are ever absolutely pure, it is difficult to determine of which gas the greater or lesser proportion is consumed.

Conditions for Welding

In preparing for welding, it is general to use two pieces of flat bar steel and lay the edges together and then experiment. Here no beveling of the edges is done as the main point is to play with the flame, burn up a few pieces of metal and possibly get a few blisters yourself.

However, on the better classes of work on all metal over ¼ inch thick the edges are beveled to a V-shape as at C of fig. 14. That is an angle of about 45 degrees is either planed, chiseled or ground out so a 90-degree angle is given between the surfaces to be welded. The reason is to give a wider splice for the weld and to get into the bottom and fuse the metal properly. Most metal of an ⅛ inch to a ¼ inch is merely butt welded as at fig. 19, which, while lighter metal of 1/16 inch thick at edge, is turned and welded as at fig. 19.

To properly inspect and test a weld a person should cut out a specimen of the weld and grind it smooth and then polish the edge to a high finish. In this way air bubbles or pieces of scale will be noticeable, as at D, fig. 14. Or, if a proper fusion was not made between the welding rod and the parts to be welded, the lines of the weld will show as at E. But if a perfect weld is made, the structure of the metal should be uniform, as at F, with the balance so it cannot be detected where the weld was made from an edge view.

Welding Rods and Flux

On cutting the V-shaped groove in metals to be welded we must use another piece of iron to help fill the groove. Sometimes some of the old chipped out metal is saved and is used to refill the groove by fusing them in place. Then, again, where edges are butt welded, as for ⅛ inch plate or such similar material, no extra V-ing is necessary and no extra material need be added. But in general a rod or wire ranging about 1/16 to ⅛ inch in thickness is used.

These are called "welding rods" and are supposed to be made of the best pure iron and steel, as for cast iron work and steel welding. The cast iron rods should be of first class quality, high in silicon and low in manganese and sulphur content so that they may be easily melted, reducing the gas consumption and producing a soft weld. These rods are a "specialty" product and are purchased from supply dealers or through wholesalers of welding equipment. Among many folks the name of Swedish iron wire has gained a strong reputation and it is claimed this product gives good satisfaction. In fact, the use of Swedish iron or any pure iron wire gives good results.

It should be remembered that silicon promotes the formation of graphite in iron, which makes it soft, while manganese and sulphur have just the opposite effect. Thus, to use the ordinary cast iron tends to produce white iron or chilled iron containing no graphitic carbon and which is intensely hard. Hence, care must be used in selecting weld-

ing rods. Ordinarily the size of the job to be done influences the size of the rod to be used. But in general small work requires small rods, since they melt quicker and do not conduct heat to the hands so readily, while heavy work requires a heavier welding rod.

Such is the general usage of most ordinary cast iron and steel work. For other steels and copper, aluminum, etc., I shall take up the discusion further as I progress from article to article. But for all the work shown in this drawing, the Swedish iron rod or its equivalent is satisfactory.

In cast iron welding most welders use a flux of one kind or another, but generally a sort of powder. The reason is that melted cast iron has a great affinity for oxygen, which combines with it to form an oxide of iron or slag as scale. This affinity which molten iron possesses for oxygen is well illustrated by the amount of slag produced during the cutting of steel, this slag being oxide of iron. In the case of cast iron the oxide is lighter than the melted metal and does not melt at quite so low a temperature.

Many kinds of fluxes for cast iron are furnished by manufacturers or by manufacturing chemists which vary considerably in composition but which differ little in efficiency under practical application. The principle of all of them is to provide some chemical which, at high temperatures, will break up the oxide into its componant parts. So for cast iron, a mixture of equal parts of carbonate of soda and bicarbonate of soda makes a very satisfactory flux.

It will be noticed, in the use of cast iron flux, as soon as a small portion of it is put on the melted iron, the surface of the metal becomes clear and mirror-like. Under such conditions, the union of the metal in the piece and the metal from the welding stick is easily made. The necessity of using a flux for cast iron may not be thoroughly appreciated, but if an attempt is made to weld cast iron without it, difficulties will at once be experienced.

Danger of Burning Present in Steel Welding

In welding steel and wrought iron a flux is not ordinarily used, although there is a certain amount of oxide formed which may be removed by the use of a cast iron flux. The melting points of both soft steel and wrought iron are higher than the melting point of the oxide, and while the oxide is lighter than the melted metal, there is more or less tendency for it to sink into the body of the weld. The judicious use of a small amount of flux will help in this difficulty.

In welding steel, the principal thing to guard against is burning the work, which no flux will overcome and which ruins the weld beyond repair. While it is not necessary to use a flux in making ordinary steel welds, it is necessary to use the proper kind of welding rod or wire. The higher the percentage of carbon in the steel, the greater is the danger of burning it. Wrought iron is different and is difficult to burn, because it is simply steel with a low percentage of carbon. Since the welding rod is considerably smaller than the weld, there is a liability of burning the rod if the torch is not properly handled. But in general, iron wire, or iron welding rods are used for steel.

Proceeding to Weld

Before getting ready to weld, see that the hose and torch are properly connected. Then turn on the oxygen by means of the hand screw of the oxygen regulator until the pressure on the small gauge corresponds to the pressures on the chart. Be sure that when this is done the oxygen valve on the blow pipe is open. Then close this valve and open the acetylene valve on the blow pipe, and then close that. Seeing that all valves work perfectly, then turn on the acetylene valve and light the torch. Next turn on the oxygen and adjust the flow to produce the neutral flame.

One of the first exercises the workman must get accustomed to is the proper movement of the tip of the torch. This is shown in fig. 15. The proper position to hold the torch and the welding rod so as to insure free movement is shown in fig. 16. For the beginner the regular control of these motions is difficult and considerable practice is required to become proficient.

The blow torch must be grasped firmly but not rigidly in the hand. It is not good practice to hold it in the fingers, because it is impossible to manipulate the flame with regularity and control, nor is it possible to do as heavy work without tiring. The head of the blow pipe should be inclined at an angle of about 60 degrees to the plane of the weld, as fig. 16 indicates.

The motion of the torch should be away from the welder and not toward him, as closer observation of the work can be obtained and greater ease in making the weld. Hence in most welding either the oscillating movement or holding the tip of the torch so that it will describe small semi-circles is employed, as shown in fig. 15. This confines the welding zone, and while the progress is not so fast, it is more thorough than the other system for heavier classes of work.

Expansion and contraction of the metal while welding and cooling presents a problem, although it can be met in several ways with good success. One of the easiest ways to learn to understand expansion and contraction is to observe it on flat sheets, in welding the edges as in fig. 17. The heating of the metal to a fusion point causes an expansion and as the weld is made, starting from one end, the contraction along the line causes the sheets to "draw in" or diverge."

Thus, to ignore this factor and seek to weld the edges hand running, the sheets will buckle over and get out of line as at c, of fig. 18. Here, at a, not a sufficient spread was given, so in welding the seam the sheets pulled together until they buckled and over-lapped, as shown at c. Of course, some folks seek to tack the seam at intervals or sort of spot weld the seam. But this causes buckles and makes an unworkmanlike job, unless the buckles can be

hammered or rolled out. This again strains the surrounding metal if used for power work and is not good practice.

The better method is to place the sheets at an angle as in fig. 17, where the distance, W, is equal to 2½ to 6 per cent of the length of the sheet or seam. In practice this divergence of plates works out to about ¼ inch per foot of length. Some welders follow this exclusively for most metals, although some metals, as copper and aluminum, have a large coefficient of expansion and, therefore, it is best to use practical judgment and test your measurements on different welding of this sort.

Another method of coping with expansion and contraction is to "pre-heat" the entire iron or steel part to be welded; that is, build a furnace or make a grate with brick around it and pack charcoal around the iron work. This causes the entire iron piece to be expanded uniformly and we call it "pre-heating." Then when the weld is made, the entire piece is allowed to cool off slowly, when the structure of the metal will adjust itself without undue strain on any one part or location.

Still another method of meeting the same difficulty is to allow a gap between the pieces to be welded; that is, let the ends to be welded remain slightly apart, so in the cooling the shrinkage will not be so great as to break the metal again. But numerous examples of these will be taken up in later articles, so that a thorough understanding of what to do under different conditions will be finally had.

However, in straight welding the broken parts are not always so long as to need special adjument. The main feature is to see at what point fusion takes place to cause the metal of the piece to melt slightly and to have the welding rod there so the drops can build up and still be thoroughly fused. With thin metal, as A and B of fig. 19, an edge is bent up and the weld is made on top of the edges, as shown at A. At B the edges are short, so the fusion of the weld flows up, closing the crease of the flange. It is well that this closing occurs, otherwise the creases would be difficult to keep clean. The result would be that they would rust out first. On thin metal oxygen and hydrogen gas are very satisfactory, since the flame is not so hot. But with a proper adjustment of tips for the torch and ample experimenting, the welder soon learns to handle himself expertly.

On metals from ⅛ to ¼ inch in thickness, the edges can be butt-welded, as at C, while bottoms are put on tanks by leaving a V-edge. Butt joints, as at C, do not require any welding rod, but by moving the torch across the edges the metal is fused into one unit. But at D, where a V-groove is left, the space must be filled in with a welding rod. In cases where heavier work is met with and the V groove is used, as at E, it is advisable to fill in the bottom well and be sure that the metal fuses properly; then build up the metal by giving the torch the semi-circular motion.

The welding torch is fast supplanting the old fashion rivet, and especially so for chimney stacks tanks, etc. Here all the joints can be welded, as at F of fig. 20. A flat band iron is run around the top and welded, as at a and b, while the longitudinal and cross seams are also welded, as at c-d and e. The flat bar can be spot welded or continuous, as at b′-a′ of detail G, while the cross seam can be a telescoped joint as at d′ or d″ of detail H. Often in welding tanks and other similar work a gas pipe is split with a cutting torch and slipped over the metal, as at g, and it is then spot welded in places. At other times the gas pipe is welded direct to the top of plate edge without splitting the pipe. Either method is satisfactory.

On large tanks, steel stacks or vats, angle bars are run around the top, as at h, of detail I. Here the edges can be welded, as at 2 and j, while the circumferential seams are often butt strapped and welded, as at k. This is a very acceptable form and one that gives good satisfaction. At other times small channel bars are used to reinforce the top, as at m, while cross joints are made with angle bars and welded, as at n in detail J.

In large tank, drum or stack welding it is claimed that the electric arc process, applied to the longitudinal seams, is quickest made and therefore most economical. But for circumferential seams the acetylene process is most serviceable. But most shops have either the one process or the other, and so comparison tests are not easily made. Workmen who have the opportunity of being around both types of welders should ask all the questions possible as regards cost of operation, time of performance and all such other data. Later I shall touch on electric arc welding, which I feel will be of interest.

J. A. McNulty Appointed Eastern Manager Joseph T. Ryerson & Son

J. A. McNulty has been appointed Eastern manager of Joseph T. Ryerson & Son, Inc., Chicago, to succeed Harry R. Heneage, who has resigned to become supervisor of athletics at Dartmouth University.

Mr. McNulty has been associated with the Ryerson company for 15 years, the entire period with the New York organization. Prior to that he was in the traffic department, first of the Lake Shore & Michigan Central and then of the Delaware, Lackawanna & Western.

Mr. McNulty's appointment is effective January 1. In recent years he has been assistant Eastern manager under Mr. Heneage.

Milwaukee Sheet Metal Opposed to Licensing Journeymen and Contractors

The Master Sheet Metal Contractors' Association of Milwaukee, Wisconsin, at its recent meeting passed a resolution putting the association on record as being opposed to the licensing of sheet metal contractors and journeymen, a bill the purpose of which is to accomplish that now being before the Wisconsin State Legislature.

The secretary, Arthur R. Po-

dolske, was instructed to get information as to when the next meeting of the Legislature takes place.

Secretary Podolske, T. E. Tonnsenn and William Hammann were appointed on the committee to act for the association in reference to the bill.

A motion was made and carried at the meeting that the scale of wages agreed upon by the association be indefinitely postponed.

The attendance prize was won by Dave Green. The attendance prize for the next meeting amounted to $5.25.

Constant Adjustment to New Conditions Price of Being in Race

Higher Price Must Now Be Paid for Success in Steel Than in Pre-War Days

By A. I. FINDLEY

THIS article is a continuation of that by A. I. Findley published in the October 23rd issue of AMERICAN ARTISAN. The address by Mr. Findley was delivered before the members of the Metal Branch of the National Hardware Association in convention at Atlantic City recently.

An interesting phase of this combination of the steel producers of Western Europe is the fact that some of the leading German units have been rehabilitated by American money. No less than $100,000,000 of securities of European steel companies have been marketed in this country, far the larger part of the proceeds going to Germany. The domestic holder of bonds or stocks of these German steel companies has behind his security the German Government's free grant to industrial corporations to combine for the purpose of maintaining prices at home and of marketing a maximum proportion of their product at lower prices in the markets of the world. He can read with a certain degree of complacency of increasing importations of German steel on our Atlantic and Pacific seaboards and at Gulf ports, knowing that the lack of profit to his company on such business will be more than made up by profitable tonnage sold at agreed prices in Continental markets. Not academic but highly practical is the interest of such an American in the workings of European cartels. In his capacity as an American business man, should he be so engaged, he is forbidden to participate in any trade agreement. As a stockholder in a European steel company he enjoys full participation in the benefits of practices on which his country has put the ban of the criminal code.

* * *

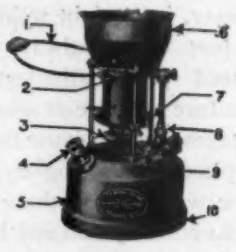
It is not surprising, in view of the amount of pig iron and steel European makers have sent to this country, even under the disorganized conditions that have prevailed yonder in the past two years, that there is serious questioning as to the effect of the new combination on the American market. Having arranged to abstain from low-price invasions of their respective territories, may we not expect that the associated European makers will try to send more rather than less steel to this, the best market in the world in which to sell their product?

If the European steel cartel succeeds to the extent that its promoters expect and becomes a permanent factor in international trade, what change, if any, may be looked for in the organization of the steel industry of the United States? It will be recalled that the majority decision of the Supreme Court in the Steel Corporation dissolution suit hinged largely on the corporation's claim that only by the economies made possible by integration on a large scale and by the diversity of products it could offer would it be able to compete successfully in the markets of the world. This new union of European steel producers for the taking of a larger share of export trade is even a stronger argument for further integration in the American steel industry than was furnished by conditions existing when the Steel Corporation was formed.

Much has been said against the anomaly of countries with no steel industry getting most of their steel at less than is paid by the peoples making the steel. The day may come when non-producing countries will pay a fair price for this most essential of all the products of the mechanic arts. But meanwhile we have a condition rather than a theory. The steel industry of the United States will not be satisfied with a smaller share of world trade. Producing today 60 per cent of the world's steel, it can only look forward to a larger outlet in the export trade. Under competitive conditions in the domestic trade, the problem of a fair profit for the ordinary producer is harder every year. Thus conditions at home and abroad are working for further steel trade consolidations as a means to still greater economies in production and distribution. In this direction the developments of the next five years, if not epoch making, will be of high importance.

Otto Bernz Company Has New Development in Gasoline Torch

Otto Bernz Company, Inc., Newark, New Jersey, has issued a circular describing their new style furnace, numbers 19 and 20. In these new developments the furnace has a coppered steel wire handle, fitted



The New Torch

with a nickel-plated grip. The filler plug has a dust proof cap. The reservoir and bottom are of heavy seamless steel.

In addition to the improvements mentioned there are seven others which are definitely outlined on the circular.

The circular also explains that these furnaces are entirely new and replace the number 13 and number 14 furnaces which they manufactured in the past.

The company has discontinued their number 16 and number 17 furnaces, which were similar to the number 14, except that the number 16 was furnished with a combination shield, and the number 17 was furnished with a 9¼-inch shield. The number 21 and number 22 furnaces take the place of these two discontinued numbers. Write them for further details.

Is Forward Buying an Indication of Insufficient Productive Capacity?

Is Seasonal Influence on Buying in Men's Mind's Rather Than in Physical Condition

THERE are, no doubt, a great many men — manufacturers, fabricators, jobbers and small contractors—in the sheet metal business who have given the curtailing of the stocks on hand some exceedingly concentrated thought, each one from his own particular angle. Whatever decisions these men may have arrived at, they can profit greatly by reading what the *American Metal Market* had to say editorially on Friday, October 15, on the "Carrying of Merchandise Stocks."

The Carrying of Merchandise Stocks

"That there is much less carrying of stocks of merchandise, in general, than there used to be is well recognized. As to the causes of the change there is apparently a fairly unanimous agreement, but as to whether the condition will continue there is a divergence of opinion.

"There is something suspicious in the point that nearly everyone professes to understand why stocks are not being carried now, while there is disagreement as to whether the custom will continue. If the causes were really understood thoroughly, it would seem that there ought to be more uniformity in opinion as to the future. Perhaps there is only a superficial comprehension of the causes.

"There is discussion on this subject and it is confused in some cases by 'hand to mouth buying' and buyers not carrying stocks being considered in the same light. They are different things, as has been repeatedly exemplified in the case of steel.

"Recently there was published the results of what was called a careful survey of hand to mouth buying, with a conclusion that the practice was probably here to stay. A prominent business newspaper then rejoined that the conclusion was too hastily reached, urging the theory that if there is hand to mouth buying, claimed to be economical, there has to be an excess of productive capacity to take care of the peaks in requirements, which is not economical.

"Both cannot be right. Where is the false assumption that results in this divergence of opinion? One promising point in answer is that we have had in a great many industries, according to much testimony, an excess of capacity, which according to theory would discourage either forward buying or the carrying of stocks by buyers. But if we look back we find in almost any industry, and certainly in the steel industry, that substantial increases in capacity came in waves, each wave being due to there being much forward buying, the forward buying being taken as proof that there was insufficient capacity. Most people will agree that, irrespective of theory, this is the way the thing has worked. Without forward buying there will not be much new construction. In a growing commodity the requirements would eventually outrun the capacity, forward buying would be resumed, and new construction would occur.

"If this is the correct line of thought both the arguments that we are in a new era and that we are not in a new era alike fade away. We are simply acting now according to present circumstances, and will in future act according to future circumstances.

"Apart from this general consideration, however, it does seem that many who have argued against the indefinite continuance of present practices have taken their facts too seriously and been too much disposed to assume that in the past carrying of stocks and forward buying were directly and completely related to physical conditions, seasonal or otherwise, and did not involve a large element of speculation on account of prices tending to swing widely. Now, all price rises are followed by declines, and if buyers have more courage they will be less influenced to buy speculatively, for they never buy at the bottom—they buy on the way up. Whence additional courage? By reason of the vastly larger amount of information now available as to trade currents.

"The remarks may be appended that it is very easy to overrate the influence of the season of year as to consumption. There is a mental season as to buying as well as a physical season as to actual consumption. To check on this matter, we have counted up the peak months in pig iron production, by reference to the *Iron Age* blast furnace report, from 1898 to the beginning of the war, 17 years. Peak months were as follows:

March, 1898.
February, 1900.
June, 1901.
May, 1902.
June, 1903.
April, 1904.
April, 1905.
October, 1907.
February, 1910.
March, 1911.

June, 1912.
February, 1913.
March, 1914.

"Here are 13 cases in 17 years. The four years omitted were years of generally rising production, 1899, 1906, 1908 and 1909.

"February, March and June came three times, April twice and May and October once each. Counting out the October, when business suddenly proceeded in the last week of the month to go to smash, the average date is April 12th or 13th. It is reasonably obvious that April cannot be the greatest month of consumption, or if it is there would be no difficulty in taking care of the matter otherwise than by much stock being carried. Pig iron, ingots, rails, tin plate, pipe, nails, etc., can be accumulated in previous months by producers sufficiently to take off the peak, and with very little expense. It looks much more, however, as if the seasonal influence, if there was one, was in men's minds rather than in physical conditions."

American Gas Machine Company Building Factory for Production of Popular Line of Stoves

By way of a fitting celebration of the thirtieth anniversary of the founding of the American Gas Machine Company of Albert Lea, Minnesota, this concern has awarded the contract for the first unit of a group of new factory buildings. Construction work is already under way.

The new factory will be used almost entirely for the manufacture of Kitchenkooks, providing ample room for further development of this particular branch of the American Gas Machine Company's business.

The transfer of the Kitchenkook department to the new plant will provide the much needed room to take care of the demand for other American products, particularly Kampkooks, Ready-Lite lamps and lanterns and Radiant Heaters.

The most modern and approved type of factory building construction will be used throughout. About four acres of additional floor space will be provided by these new buildings, more than doubling the capacity of the present plant.

W. D. Cover Identifies Himself with The Henry Furnace & Foundry Co., Cleveland

W. D. Cover has joined the personnel of The Henry Furnace & Foundry Co., Cleveland, Ohio, makers of the Moncrief furnace.

"I have known Mr. Henry and Mr. Moncrief of the Henry Furnace & Foundry Company a good many years," said Mr. Cover, commenting upon his connection, "and have always highly respected them and their associates. I know they make a high-grade line of furnaces, pipe and fittings, and that their methods of doing business are of the very finest.

"When I was presented the opportunity of joining forces with them, I was planning to take an extended vacation on the Pacific Coast. I had closed up my house and had not set any time for coming back. The idea of sitting around on a hotel veranda and telling how it used to be done didn't appeal to me a bit. It seemed to me the best way to live long and be happy would be to join up with a good live company and get right into what promises to be the livest business in the country. So here I am, and glad to be here."

There are today few men who have a better knowledge of the requirements of the furnace trade than Mr. Cover.

His past record is an inspiration to any man who believes in hard work, intelligent service and square dealing.

Polack Hardware Company Incorporate for $15,000

Polack Hardware Company, 155 North Clark Street, Chicago, has been incorporated with $15,000 capital to manufacture metal window frames and sashes and hardware by Isadore J. Polack, Mark Salomon and Louis Suekoff. Altheimer & Mayer, 10 South LaSalle Street, are attorneys.

Automatic Humidifier.

From Smith Plumbing and Heating Company, Anamosa, Iowa.

Please advise us where we can get an Automatic Humidifier for top of radiator that will evaporate eight to ten gallons of water a day.

Ans.—Carr Supply Company, 414 North Dearborn Street, Chicago, Illinois, and Robinson Furnace Company, 205 West Lake Street, Chicago, Illinois, also Kansas City Furnace Co., 326-28 West 6th Street, Kansas City, Misssouri.

Hart's Combination Heater

From Koener and Sons, Du Quoin, Illinois.

Please advise us who makes the Hart's Combination Heater.

Ans.—Hart & Crouse Company, Utica, New York.

Gutter Spikes

From E. W. Hiatt, Post Office Box 1703, Sarasota, Florida.

Please advise me who makes gutter spikes.

Ans.—American Steel and Wire Company, 208 South La Salle Street, Chicago, Illinois.

Patterns for Metal Rowboats

From C. L. Featherstone Furnace Company, 520 West Second Avenue, Spokane, Washington.

Please advise us who manufactures metal rowboats.

Ans.—H. F. Thompson Boat and Pattern Works, Decorah, Iowa.

"Marvel" Oil Heating Stove

From F. H. Good, Burt, Iowa.

Please inform me where the Belmont Stove Company is located, they making an oil heating stove called "Marvel."

Ans.—The "Marvel" oil heating stove is manufactured by the United Stove Company, Ypsilanti, Michigan.

Cast Iron Smoke Pipe

From Steptoe & Arksey, Dexter, Michigan.

Please inform us who manufactures cast iron smoke pipe.

Ans.—Waterloo Register Company, Waterloo, Iowa, and Faultless Castings Company, Brazil, Indiana.

Relation Existing Between Gross Profit and Present Overhead*

Are Hardware Men Charging Proper Rental on Buildings Owned?

By H. W. Conde

LET us consider first the present overhead which we all discuss here in Atlantic City each year. It is not my intention at this time to go into details on this side of the subject, for this will be well taken care of in the general discussion of overhead expense.

I do want to bring out one item which, next to salary and wages, is a very important part of our overhead expense, namely, our real estate and rental charges. I wonder if a great many of us are charging the proper rental on buildings which are owned by our own particular companies. I refer and have in mind particularly a situation which exists with my own company.

We built a warehouse in 1911; if we should have to replace this building today it would cost us at least twice what it did in 1911. If we had to rent this building, based on the present replacement value, we would have to pay a rental charge of at least 10 per cent on today's valuation.

We are only charging against this particular building, taxes, ordinary upkeep and 2 per cent depreciation, and this figure is considerably less than we would have to pay on a proper rental basis. Therefore, we are apparently enjoying a profit on hardware which would not exist if we made the proper rental charge. If this case exists with other houses and I have known of places where it does, are we not fooling ourselves a little bit on our total overhead expense?

Likewise, by reference to Mr. Fernley's chart, I find that during the last three years the operating expense has shown a slight increase and that during the last five years it has shown an average of 16.28 and the year 1925 shows a total operating expense of 16.18. Therefore, it is apparent that during the above named period the operating expense of doing business has changed but little. Note: I am referring to operating expense, not total overhead expense.

Based on these figures and what appears to me the consensus of sound business opinion, I do not believe it is possible during the next decade to reduce the overhead expense materially, unless we do so to the detriment of our own business.

The statement has been made to me many times and am I not correct that the average net profit of hardware distributors of the United States runs from 2 to 5 per cent on the total business, and, frankly, is it not nearer 2 per cent rather than 5 per cent?

In other words, if a house is doing a business of $2,000,000 a year under present conditions, isn't $40,000 to $60,000 the best net profit that you can hope to make under normal years, and, if this is the case, does it show a fair return for the money invested and the efforts expended? Will it show you better than a net return of 6 per cent on the invested capital and if it does not show more than 6 per cent what is there left for a safe surplus and for a reasonable expansion and natural growth? Possibly I am wrong in my figures and I hope that that is the case. If so the above statements amount to naught.

Another thing, before discussing gross profits I feel and I think the association at large feels that, as shown during the World war, the hardware jobbers are an economical and essential part of merchandising in this country, and if the jobbers of hardware are not able to make a fair return for their efforts and money invested it would work a detriment to the retailer for whom we are all working. We need the retailer and the retailer needs us.

This now brings up the question as to what are some of the remedies.

I think it is the practice of most houses to give their salesmen too much leeway in making prices. The sales manager of each house takes a line of goods, puts a price on same which only shows a fair return. The salesman knows his cost, he is told that one of his competitors is lower, the salesman naturally hates to lose an order. In the first place, does he investigate and ascertain definitely if the assertion of the buyer is correct? No, the average salesman reduced the suggested selling price of the sales manager, writing in to him and telling him he had to meet John Jones' competition. A salesman from another house reports he finds the price has been cut and so advises his house or he meets it and the outcome is that the established price on this particular item is lowered and the margin of profit obtained is not sufficient to take care of the overhead and give a fair return on this particular item. I maintain strongly that salesmen should not be given this leeway.

A very good friend of mine who is a sales manager in one of the large jobbing houses in the East told me one of his reasons for making very low prices on leading items was for "prestige." This may be a good argument and sound very rosy, but I do not think that in the long run cut prices build up a business.

Prior to the war, on competitive staple items we used to add what might be termed a unit profit rather than percentage. Now, with these items costing from 50 to 80 per cent more than they did prior to the war, are we not going back to the old unit profit rather than figuring a proper percentage? I think this point has quite a little to do with bringing down our gross profits.

I would like to ask a question. How many of us are following suggested resale prices as established

*Address by H. W. Conde, W. W. Conde Hardware Company, Watertown, New York, delivered at National Hardware Association convention at Atlantic City, New Jersey, the week of October 19.

by manufacturers? I have heard discussed many times the fact that the manufacturers do not in their suggested resale price leave to the distributor a fair margin of profit, and I think it is true in a great many cases, but aren't we a little guilty ourselves when manufacturers establish prices if we go out and offer this particular item at a price less than their suggested price?

I ask another question: Are we getting the proper margin of profit on small items which cost us a great deal more to handle? Particularly in cases of broken packages, aren't we more inclined to take the line as a whole and add a flat percentage to the line, rather than to add a certain percentage to each item based on the cost of handling same?

In making our selling prices are we also bearing in mind that a certain percentage of our net profits has to be paid back into income taxes, and do we take this into consideration when selling hardware. I do not know what the taxes are in the different states; I do know that in the State of New York that on every $1 profit shown it is approximately 17 cents which is paid to the Federal and State Government.

Finally, are we not inclined in our efforts for more gross business and expansion to endeavor to sell merchandise in unnatural territories. If we are inclined to do so, how can we get business unless we sell cheaper than jobbers who are geographically located to give better service than a house much farther away. If these cut prices are made to get business, the other fellow meeting them, the result, a lower level is established.

American Welding Society, Annual Fall Meeting, Buffalo, New York, November 17, 18 and 19, 1926. Carl D. Miller, secretary, Burke Electric Company, 508 Morgan Building, Buffalo.

National Warm Air Heating and Ventilating Association mid-year meeting, Urbana, Illinois, December 1 and 2, 1926, Urbana-Lincoln Hotel. Allen W. Williams, secretary, 174 East Long Street, Columbus, Ohio.

Western Warm Air Furnace & Supply Association meeting, Hotel Sherman, Chicago, December 3 and 4, 1926. John H. Hussie, 2407 Cuming Street, Omaha, Nebraska, Secretary.

West Virginia Hardware Association Convention and Exhibition, Parkersburg, January 18, 19, 20, 21, 1927. James B. Carson, secretary, 411 Mutual Home Bldg., Dayton, Ohio.

Texas Sheet Metal Contractors' Association, Hotel Adolphus, Dallas, Texas, April 24 and 25. Harry Stanyer, Secretary-Treasurer, 2422 Alamo Street, Dallas.

National Association of Sheet Metal Contractors, Adolphus Hotel, Dallas, Texas, April 26, 27, 28 and 29, 1927. W. C. Markle, Secretary, 850 West North Avenue, Pittsburgh, Pennsylvania.

Mountain States Hardware and Implement Association Convention, Denver, January 18, 19, 20, 1927. W. O. McAllister, Secretary, P. O. Box 513, Boulder.

Texas Hardware & Implement Association Convention, Dallas, Texas, January 18 to 20, 1927. Dan Scoates, P. O. Box H, College Station, Texas, secretary.

Missouri Retail Hardware Association Convention and Exhibition, headquarters, Hotel Statler, St. Louis, January 24, 25, 26, 1927. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis.

Indiana Retail Hardware Association Convention, Claypool Hotel, Indianapolis, Exhibition at Cadle Tabernacle, January 24, 25, 26, 27, 1927. G. F. Sheely, Secretary-Treasurer, 911-913 Meyer Kiser Bank Building, Indianapolis.

Oklahoma Hardware and Implement Association Convention, headquarters, Masonic Temple, Oklahoma City, January 25, 26, 27, 1927. Charles L. Unger, Secretary-Treasurer, 207-208 Bloomfield Building, Oklahoma City.

Connecticut Hardware Association Convention, New Haven, February, 1927. Henry S. Hitchcock, Secretary, Woodbury.

Nebraska Retail Hardware Convention and Exposition, February 1, 2, 3, 4, 1927. Headquarters, Cornhusker Hotel, Lincoln. George H. Dietz, Secretary-Treasurer, 414-419 Little Building, Lincoln.

Wisconsin Retail Hardware Association Convention and Exhibition, headquarters, Auditorium, Milwaukee, February 1, 2, 3, 4, 1927. George W. Kornely, 1476 Green Bay Avenue, Milwaukee, Exhibit Manager. P. J. Jacobs, Secretary-Treasurer, Stevens Point.

Kentucky Hardware and Implement Association convention and exhibition. Jefferson County Armory, Louisville, Kentucky, February 1 to 4, 1927. J. M. Stone, 200 Republic Building, Louisville, Kentucky, secretary and treasurer.

North Dakota Retail Hardware Association Convention and Exhibition, Grand Forks, February 8, 9, 10, 1927. C. N. Barnes, Secretary, Grand Forks.

Iowa Retail Hardware Association Convention, headquarters, Hotel Savery, Des Moines. Exhibition at Des Moines Coliseum, February 8, 9, 10, 11, 1927. A. R. Sale, Secretary, Mason City.

New York State Retail Hardware Association, Inc. Convention headquarters, Eyck Hotel, Albany. Exhibition at State Armory, February 8, 9, 10, 11, 1927. John B. Foley, Secretary, City Bank Building, Syracuse.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, Michigan, February 8, 9, 10, 11, 1927. Arthur J. Scott, Secretary, Marine City, Michigan. K. S. Judson, 248 Morris Avenue, Grand Rapids, Michigan, Exhibit Manager.

Minnesota Retail Hardware Association Convention and Exposition, St. Paul, February 15 to 18, 1927. Manager and Treasurer, Charles H. Casey, Nicollet at 24th Street, Minneapolis, Minnesota.

Pennsylvania and Atlantic Seaboard Hardware Association, Philadelphia Commercial Museum, February 15, 16, 17 and 18, 1927. Sharon E. Jones, Secretary-Treasurer, Wesley Building, Philadelphia, Pennsylvania.

Ohio Hardware Association Convention and Exhibition, Columbus, February 15, 16, 17, 18, 1927. James B. Carson, secretary, 411 Mutual Home Bldg., Dayton.

Illinois Retail Hardware Association convention and exhibit, Hotel Sherman, Chicago, February 15, 16, 17, 1927. Leon D. Nish, 14 North Spring Street, Elgin, Illinois, secretary.

California Retail Hardware and Implement Association Convention and Exhibition, Sacramento Memorial Auditorium, February 15, 16, 17, 18, 1927. Hotel headquarters, The Senator. Le Roy Smith, Secretary, 112 Market Street, San Francisco.

South Dakota Retail Hardware Association Convention, headquarters, Coliseum, Sioux Falls, February 22, 23, 24, 1927. Chas. H. Casey, Manager-Treasurer, Nicollet Avenue and 34th Street, Minneapolis.

New England Hardware Dealers' Convention and Exhibition, Mechanics' Building, Boston, Massachusetts, February 22, 23 and 24, 1927. George A. Fiel, Secretary, 80 Federal Street, Boston.

Retail Hardware Doings

Iowa

Lambert and Goen of Fenton have purchased the Fenton Hardware Company.

Kansas

Otto E. Baker has purchased the hardware store of F. E. Stuchbery at De Soto.

Mr. W. A. Teson of Moline opened a new store which is known as the Moline Hardware Company.

The Shanlef Hardware Store, Washington, has been purchased by Mr. C. S. Allender.

Michigan

The hardware store of Pray and Stephens on South Washington Street, Owosso, has been purchased by Mr. Theodore Baker.

Minnesota

The O. A. Hart Hardware Store of Rock Creek has been destroyed by fire.

South Dakota

The Smith Hardware Company of Sioux Falls is now located on Minnesota Avenue and Eighteenth Street.

Texas

Mr. Earl Gregory has purchased the hardware stock of Mr. G. Jackson of Bowie and has taken immediate charge.

Wisconsin

F. W. Peterson has completed an addition to his hardware store at Oconto Falls.

"*Yes Ma'am,* that's a good roof job on your new house. I've used the best materials throughout. For instance—Lupton Elbows—made extra heavy and every joint a 2½" lap. So just forget about leaks —you'll never be bothered."

Specify them to your Jobber

LUPTON

ELBOWS THAT FIT

DAVID LUPTON'S SONS CO.

Allegheny Ave. and Tulip Street Philadelphia, Pa.

Demand in Steel Market Recedes--Further Decrease Expected as Month Advances

Pig Iron Market Steady--Lead Takes Slight Drop

"IN THE Pittsburgh and adjoining districts steel production now is slightly above 75 per cent of capacity, against 80 last week and an average of 85 for August and September," says *Iron Age*. "The U. S. Steel Corporation's rate is still close to 83 per cent, but it is expected to fall off somewhat as the month advances. New business is exceeded by shipments, but owing to considerable bookings of rails last month, the statement of unfilled orders as of October 31 is likely to show some increase.

"Pittsburgh mills find the automobile curtailment the chief factor in the lessened demand.

"In structural steel the falling off is progressive, and the agricultural situation has not yet cleared enough to decide the steel requirements of the implement companies.

"Pig iron sales reached the largest total in many weeks and prices have advanced 50 cents to $1 a ton."

Pig Iron

The Pittsburgh pig iron market is in a state of flux. Numerous merchant and steel plant producers are quoting $1 more than their last week's selling prices, to offset the automatic advance in their coke costs, due to wage clauses in coke contracts.

The higher pig iron prices are not yet substantiated by sales, except one sale of malleable iron by a steel interest to a local roll foundry. A few hundred tons, it is reported, brought $20 f.o.b. Pennsylvania furnace, having the same freight rate to Pittsburgh as that from the valley.

Buyers are reluctant to close at the new prices, believing the market will ease off. Sellers say this is not likely. Inquiries usually involve 1,000 tons or less.

No interest in basic iron is manifest. Several hundred tons of foundry iron were sold last week at $19, but producers now ask $20 base for this iron.

One interest sold 750 tons of Bessemer to various buyers at $19.50, but now quotes $20.50 minimum per ton rate.

While at Chicago sales of Northern No. 2 foundry and malleable are at the rate of the past few weeks, inquiry has been stimulated by the export of coking coal to England. Spot selling for fourth quarter maintains an even keel.

The October total sales probably will aggregate a 15 to 20 per cent increase over September. October shipments indicate little gain over the preceding month.

The pig iron market is firm at $20 base, Birmingham, for this quarter. Inquiry for first quarter has not developed and the price for the delivery is indefinite. Sales equal output.

Tin

Tin was the most erratic in the non-ferrous group, but consumers bought good quantities, mostly for November, and speculators and dealers at times also made large purchases, with some of their business running much farther ahead.

The market broke under 68 cents for spot and nearby and under 66 cents on futures, the first in a long time, with the continued fall in London on Monday, but buying caused a quick recovery here the same day.

Spot has been getting easier, but was so pinched Monday that it sold more than 1 cent above metal to arrive next week and 2½ cents above December delivery.

Zinc

Prime western zinc sold at 7.25 cents, East St. Louis, Saturday and Monday, or a little higher than other days of the week. Some prices were heard as low as 7.20 cents Monday morning, but they quickly disappeared and some prompt was as high as 7.30 cents as a new high level.

Moderate business has been done each day, mostly for November, but some for December. Brass special is mostly 5 to 10 points and high grade steady, 9.25 cents to 9.50 cents.

Copper

The copper market has shown much resistance at 14 cents delivered Connecticut (14.12½ cents Midwest), though not much business has been done. However, shipments continue near refinery capacity, especially is this true of metal for domestic use.

Lead

The drop in lead in London on Monday was a surprise here, but caused a smaller drop here, 15 points in New York and 10 in the St. Louis market, 8.10 cents and 7.90 cents, respectively.

Business at 8 cents, East St. Louis, was of good size last week, but New York was less active on this metal.

Solder

Chicago warehouse prices on solder as as follows: Warranted 50-50, $43.25; commercial 45-55, $40.25, and plumbers', $37.25, all per 100 pounds.

Old Metals

Wholesale quotations in the Chicago district, which should be considered as nominal, are as follows: Old steel axles, $16.50 to $17.00; old iron axles, $22.00 to $22.50; steel springs, $16.00 to $16.50; No. 1 wrought iron, $12.25 to $12.75; No. 1 cast, $15.50 to $16.00, all per net tons. Prices for non-ferrous metals are quoted as follows, per pound: Light copper, 9 cents; zinc, 5 cents, and cast aluminum, 18 cents.

Chicago Warehouse Metal and Furnace Supply Prices

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON

Chicago Fdy., No. 2	$21 00
Southern Fdy., No. 2	26 01
Lake Superior Charcoal	27 04
Malleable	31 00

FIRST QUALITY BRIGHT TIN PLATES

IC	20x28 112 sheets	$25 10
IX	20x28	29 60
IXX	20x28 56 sheets	16 20
IXXX	20x28	17 55
IXXXX	20x28	18 95

TERNE PLATES

	Per Box
IC 20x28, 40-lb. 112 sheets	$27 90
IX 20x28, 40-lb. 112 sheets	30 90
IC 20x28, 25-lb. 112 sheets	22 20
IX 20x28, 25-lb. 112 sheets	25 20
IC 20x28, 20-lb. 112 sheets	20 25
IV 20x28, 20 lb. 112 sheets	23 00
IC 20x28, 15-lb. 112 sheets	16 55

"ARMCO" INGOT IRON PLATES

No. 8 ga. up to and including ¼ in.—100 lbs. $4 55

COKE PLATES

Cokes, 80 lbs., base, 20x28	$12 60
Cokes, 90 lbs., base, 20x28	12 80
Cokes, 100 lbs., base, 20x28	13 00
Cokes, 107 lbs., base, Ic 20x28	13 30
Cokes, 135 lbs., base, IX 20x28	15 70
Cokes, 155 lbs., base, 56 sheets	8 70
Cokes, 175 lbs., base, 56 sheets	9 55
Cokes, 195 lbs., base, 56 sheets	10 40

BLUE ANNEALED SHEETS

Base 10 ga. per 100 lbs.	$2 80
"Armco" 10 ga. per 100 lbs.	4 00

ONE PASS COLD ROLLED BLACK

No. 18-20 per 100 lbs.	$3 75
No. 22 per 100 lbs.	3 90
No. 24 per 100 lbs.	3 95
No. 26 per 100 lbs.	4 05
No. 27 per 100 lbs.	4 10
No. 28 per 100 lbs.	4 20
No. 29 per 100 lbs.	4 35
No. 30 per 100 lbs.	4 45

"ARMCO" GALVANIZED

"Armco" 24 per 100 lbs. $6 25

GALVANIZED

No. 16 per 100 lbs.	4 30
No. 18 per 100 lbs.	4 45
No. 20 per 100 lbs.	4 60
No. 22 per 100 lbs.	4 65
No. 24 per 100 lbs.	4 80
No. 26 per 100 lbs.	5 05
No. 27 per 100 lbs.	5 15
No. 28 per 100 lbs.	5 30
No. 30 per 100 lbs.	5 70

BAR SOLDER

Warranted

50-50 per 100 lbs. 43 25

Commercial

45-55 per 100 lbs.	40 25
Plumbers per 100 lbs.	37 25

ZINC

In Slabs $8 50

SHEET ZINC

Cash Lots (600 lbs.)	$13 75
Sheet Lots	14 75

BRASS

Sheets, Chicago base	18⅞c
Mill base	18⅞c
Tubing, brazed base	27⅞c
Wire, base	19⅞c
Rods, base	16⅞c

COPPER

Sheets, Chicago base	22½c
Mill base	21½c
Tubing, seamless base	25½c
Wire, No. 9 B & S Ga.	19c
Wire, No. 10, B & S Ga.	19¼c
Wire, No. 11, B & S Ga.	19¼c
Wire, No. 8, B & S Ga. and heavier	18⅝c

HARDWARE, SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES.

LEAD

American Pig	$ 9 00
Bar	10 00

Sheet

Full Coils per 100 lbs.	14 00
Cut Coils per 100 lbs.	14 25

TIN

Pig tin per 100 lbs.	77 00
Bar tin per 100 lbs.	78 00

ASBESTOS

Paper up to 1/16	8c per lb.
Roll board	6¼c per lb.
Mill board 3/32 to ½	6c per lb.
Corrugated Paper (250 sq. ft. to roll)	$6.00 per roll

BRUSHES

Hot Air Pipe Cleaning

Bristle, with handle, each $0 85

Flue Cleaning

Steel only, each 1 25

BURRS

Coppers Burrs only 40%

CEMENT, FURNACE

American Seal, 5-lb. cans, net	$ 40
American Seal, 10-lb. cans, net	80
American Seal, 25-lb. cans, net	2 00
Pecora per 100 lbs.	7 51

CHIMNEY TOPS

Iwan's Complete Rev. & Vent	30%
Iwan's Iron Mountain only	35%
Standard	30 to 40%

CLINKER TONGS

Front Rank, each	$0 75
Per doz.	8 40

CLIPS

Damper

Acme, with tall pieces, per doz. $1 25

Non Rivet tail pieces, per doz. 25

COPPERS—Soldering

Pointed Roofing

3 lb. and heavier per lb.	40c
2½ lb. per lb.	45c
2 lb. per lb.	48c
1½ lb. per lb.	55c
1 lb. per lb.	60c

CORNICE BRAKES

Chicago Steel Bending

Nos. 1 to 6B Net

CUT-OFFS

Kuehn's Korrekt Kutoffs: Galv., plain, round or cor. rd. standard gauge 40%

26 gauge 30%

DAMPERS

"Yankee" Hot Air

7 inch, each 20c, doz.	$1 75
8 inch, each 25c, doz.	2 40
9 inch, each 30c, doz.	2 75
10 inch, each 33c, doz.	3 00

Smoke Pipe

7 inch, each	$0 35
8 inch, each	40
9 inch, each	50
10 inch, each	60
12 inch, each	90

Reversible Check

8 inch, each	$1 50
9 inch, each	1 70

DIGGERS

Post Hole

Iwan's Split Handle (Eureka)

4-ft. Handle per doz.	$14 00
7-ft. Handle per doz.	36 00

Iwan's Hercules pattern, per doz. 14 00

EAVES TROUGH

Galv. Crimpedge, crated..75 & 5%

ELBOWS

Conductor Pipe Milcor.

Galv., plain or corrugated, round flat Crimp.

28 Gauge	60%
26 Gauge	45%
24 Gauge	15%

Square Corrugated

No. 28 Gauge	50%
26 Gauge	35%

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.

Not nested	70 & 5%
nested solid	70 & 5%

ELBOWS—Stove Pipe

1-piece Corrugated. Uniform Blue "Milcor" No. 28 gauge.

	Doz.
5-inch	$1 15
6-inch	1 25
7-inch	1 75

Special Corrugated

6-inch	$1 00
7-inch	1 60

Adjustable—Uniform Blue

"Milcor" No. 28 Gauge. Uniform Blue.

5-inch	$1 65
6-inch	1 75
7-inch	2 40

WOOD FACES—50% off list.

FENCE

726-6-12½% (100 rods)	$23 63
1948-6-14½% (100 rods)	43 62

FILES AND RASPS

Heller's (American)	50-10%
American	60-10%
Arcade	50%
Black Diamond	40-10-5%
Eagle	50%
Great Western	50%
Kearney & Foot	50%
McClellan	50%
Nicholson	50%
Simonds	60%

FIRE POTS

Otto Bernz Co.

East of west boundary line of Province of Manitoba Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma Amarillo, San Angelo and Laredo, Texas 65%

West of above boundry 61%

Clayton & Lambert's

East of west boundary line of Province of Manitoba, Canada, No. Dakota, So. Dakota, Nebraska, Kansas, Oklahoma, Amarillo, San Angelo and Laredo, Texas 52%

West of above boundary line 48%

Geo. W. Diener Mfg. Co. Ea.

No. 02 Gasolene Torch, 1 qt.	$ 5 55
No. 0250, Kerosene, or Gasolene Torch, 1 qt.	7 50
No. 10 Tinners' Furn. Square tank, 1 gal.	12 00
No. 15 Tinners' Furn. Round tank, 1 gal.	13 00
No. 21 Gas Soldering Furnace	3 00
No. 110 Automatic Gas Soldering Furnace	10 00

Double Blast Mfg. Co.

Gasolene, Nos. 25 and 26..60%

Quick Meal Stove Co.

Vesuvius, F. O. B. St. Louis 30%

(Extra Disct. for large quantities)

Chas. A. Hones, Inc.

Buzzer No. 1	$ 9 00
Buzzer No. 2	12 00
Buzzer No. 22	13 50
Buzzer No. 42	15 00
Buzzer No. 43	19 00

GALVANIZED WARE

Pails (Galv. after made), 10-qt.	$2 12
Tubs (Galv. after made).	
No. 1	6 00
No. 2	6 85

GLASS

Single Strength, A, 25-in. brackets	85%
Single Strength, A, 24 to 40-in. bracket	82%
Single Strength A, all other brackets	81%
Double Strength A, all sizes	82%

HANGERS

Conductor Pipe

Milcor Perfection Wire 25%

Eaves Trough

Milcor Eclipse Wire	15%
Milcor Triplex Wire	10%
Milcor Milwaukee Extension	10%
Milcor Steel (galv. after forming) List plus	12½%
Milcor Selflock E. T. Wire, List plus	50%

HOOKS

Box

V. & B. No. 1, each $0 26

Conductor

Milcor

"Direct Drive" Wrought Iron for wood or brick 15%

Hay

V. & B. No. 1, each $0 26

HUMIDIFIERS

"Front-Rank," Automatic

In single lots	50%
In lots of 10 or more	50-5%
In lots of 25 or more	50-10%
Vapor pans, etc., each	50%

LIFTERS

Stove Cover

Coppered per gro.	$5 00
Alaska per gro.	4 75

MALLETS

Tinners

Hickory per doz. $2 25

MITRES

Galvanized steel mitres, and caps, end pieces, outlets 30%

Milcor

Galv. one piece stamped..40%

NAILS

Cut Steel	$4 25
Cut Iron	4 25

Wire

Common	3 85
Cement Coated	3 85

(Continued on page 44)

ADVERTISERS' INDEX

The dash (—) indicates that the advertisement runs on a regular schedule but does not appear in this issue.

Markets—Continued from page 42

NETTING, POULTRY

Galvanized before weaving 87½-5%
Galvanized after weaving..52½-5%

PASTE

Asbestos Dry Paste:

200-lb. barrel $14 00
100-lb. barrel 7 75
25-lb. pail 2 00
10-lb. bag 1 10
5-lb. bag 60
2½-lb. cartons 35

PIPE

Conductor
Cor. Rd., Plain Rd. or Sq.

"Interlock" Galvanized
Crated and nested (all gauges) 75-2½%
Crated and not nested (all gauges) 70-15%
"Milcor" "Titelock" Uniform Blue Stove
28 gauge, 5 inch U. C. nested 11 00
28 gauge, 6 inch U. C. nested 12 00
28 gauge, 7 inch U. C. nested 14 00
30 gauge, 5 inch U. C. nested 10 00
30 gauge, 6 inch U. C. nested 10 50
30 gauge, 7 inch U. C. nested 13 00

T-Joint Made up
6-inch, 28 ga.....per 100 32 50

Furnace Pipe
Double Wall Pipe and Pipe Fittings 40%
Single Wall Pipe, Round Iron Pipe Galvanized.....40%
Galvanized and Black Fittings 40%
Milcor Galvanized Pipe and Fittings.....40%

Lead
Per 100 lbs. $12 50

POKERS, STOVE

Wr't Steel, str't or bent, ...per doz. $0 75
Nickel Plated, coil handles, ...per doz. 1 10

POKERS, FURNACE

Each $0 50

PULLEYS

Furnace Tackle....per doz. $0 40
per gross 6 00
Furnace Screw (encased) .....per doz. 75

Ventilating Register
Per gross 9 00
Small, per pair..... 20
Large, per pair..... 50

PUTTY

Commercial Putty, 100-lb. kits $3 40

QUADRANTS

Malleable Iron Damper.....10%

REDUCERS—Oval Stove Pipe

Per doz.
7—6, 1 doz. in carton.....$2 00

BASEBOARD REGISTERS

Excelsior 50%

FLOOR REGISTERS AND BORDERS

Cast Iron 20%
Steel and Semi-Steel.....40%
In lots less than 50 .....33⅓%
Baseboard 40%
In lots less than 50.....33⅓%
Adjustable Ceiling Ventilators 40%

Register Faces—Cast and Steel
Japanned, Bronzed and Plated, 4x8 to 14x14 .....40%
In lots less than 50.....33⅓%
Large Register Faces—Cast, 14x14 to 33x42 .....50%
Large Register Faces—Steel, 14x14 to 33x42 .....65%
In lots less than 50.....60%

RIDGE ROLL

Milcor
Galv., Plain Ridge Roll, b'did 75-10-5%
Galv., Plain Ridge Roll, crated 75-10%
Globe Finials for Ridge Roll..50%

ROOFING

	Per Square
Best grade, slate surf. prep'd	$3 30
Best talc surfaced	2 65
Medium talc surfaced	2 00
Light talc surfaced	1 30
Red Rosin Sheeting, per ton	57 00

SCREWS

Sheet Metal

No. 7, ½x⅛, per gross...$0 52
No. 10, ⅝x3/16, per gross 61
No. 14, ⅞x¼, per gross... 89

SHEARS, TINNERS' & MACHINISTS'

Viking $22 00

Lennox Throatless
No. 18 .....35%
Shear blades 10%
(f. o. b. Marshalltown, Iowa.)

SHIELDS, REGISTER

No. 1 "Gem," floor....$12 00 doz.
No. 2 "Gem," wall.... 6 00 doz.

SHOES

Milcor
Galv. 28 Gauge, Plain or corg. round flat crimp...60%
26 gauge round fit crimp..45%
24 gauge round flat crimp..15%

SNIPS, TINNERS'

Clover Leaf .....40 & 10%
National .....40 & 10%
Star 50%
Milcor .....Net

SQUARES

Steel and Iron .....Net
(Add for bluing, $3 per doz. net.)
Mitre .....Net
Try .....Net
Try and Bevel.....Net
Try and Mitre.....Net
Fox's .....per doz. $6 00
Winterbottom's 10%

STOPPERS, FLUE

Common .....per doz. $1 10
Gem, No. 1.....per doz. 1 10
Gem, flat, No. 2....per doz. 1 00

VENTILATORS

Standard .....30 to 40%

WIRE

Plain annealed wire, No. 8 per 100 lbs. $3 00
Galvanized barb wire, per 100 lbs. 3 90
Wire cloth—Black painted, 12-mesh, per 100 sq. ft.... 1 75
Cattle Wire—galvanized catch weight spool, per 100 lbs. 3 85
Galvanized Hog Wire, 80 rod spool, per spool 3 34
Galvanized plain wire, No. 9, per 100 lbs. 3 50
Steve Pipe, per stone..... 1 10

WRINGERS

No. 730,	Guarantee	per doz.	$55 00
No. 770,	Bicycle	per doz.	52 50
No. 670,	Domestic	per doz.	48 50
No. 110,	Brighton	per doz.	42 50
No. 750,	Guarantee	per doz.	55 50
No. 740,	Bicycle	per doz.	52 50
No. 22,	Pioneer	per doz.	29 00
No. 2,	Superb	per doz.	29 00

BUYERS' DIRECTORY

Asbestos Paper.
Sall Mountain Co., Chicago, Ill.

Asbestos Products.
Sall Mountain Co., Chicago, Ill.

Bale Ties.
American Steel & Wire Co., Chicago, Ill.

Blowers.
Sturtevant Co., B. F., Boston, Mass.

Bolts—Stove.
The Kirk-Latty Co., Cleveland, Ohio

Brakes—Bending.
Dreis & Krump Mfg. Co., Chicago, Ill.

Brakes—Cornice
Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper
Copper & Brass Research Association, New York
Hussey & Co., C. G., Pittsburgh, Pa.
Merchant & Evans Co., Philadelphia, Pa.

Cans—Garbage
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable.
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
Wheeling Corrugating Co., Wheeling, W. Va.

Chaplets.
Fanner Mfg. Co., Cleveland, Ohio

Chain—Sash.
Parker-Kalon Corp., New York, N. Y.

Chimney Tops.
Standard Ventilator Co., Lewisburg, Pa.

Cleaners—Furnace.
Sturtevant, Boston, Mass.

Christmas Cards.
Friedman & Peck, Chicago, Ill.

Cleaners—Suction.
Sturtevant, Boston, Mass.

Copper.
Copper & Brass Research Association, New York
Hussey & Co., C. G., Pittsburgh, Pa.

Cornices.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Cut-Offs—Rain Water.
Milwaukee Corrugating Co., Milwaukee, Wis.

Dampers
S. M. Howes Co., Charlestown, Mass.

Damper Clips
S. M. Howes Co., Charlestown, Mass.

Diffuser—Air Duct.
Aeolus-Dickinson Co., Chicago, Ill.

Doors—Metal.
David Lupton's Sons Co., Philadelphia, Pa.

Eaves Trough.
Berger Bros. Co., Philadelphia, Pa.
Berger Co., L. D., Philadelphia, Pa.
Clark-Smith Hardware Co., Peoria, Ill.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
New Jersey Zinc Sales Co., The, New York, N. Y.
Wheeling Corrugating Co., Wheeling, W. Va.

Elbows and Shoes—Conductor.
American Rolling Mill Co., Middletown, Ohio
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Double-Duty Mfg. Co., Aurora, Ill.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Enamel Wire.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Wood Faces—Cold Air.
American Wood Register Co., Plymouth, Ind.
Eaglesfield Ventilator Co., Indianapolis, Ind.
Milwaukee Corrugating Co., Milwaukee, Wis.

Fences.
American Steel & Wire Co., Chicago, Ill.

Flue Thimbles.
Milwaukee Corrugating Co., Milwaukee, Wis.

Furnace Cement—Asbestos.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Milwaukee Corrugating Co., Milwaukee, Wis.
Pecora Paint Co., Philadelphia, Pa.
Sall Mountain Co., Chicago, Ill.

Furnace Cement—Liquid.
Technical Products Co., Pittsburgh, Pa.

Furnace Cleaners.
Sturtevant Co., B. F., Boston, Mass.

Furnace Fans.
Sturtevant Co., B. F., Boston, Mass.
Warm Air Furnace Fan Co., The, Cleveland, Ohio
A. H. Robinson Company, Cleveland, Ohio

Furnace Rings.
Milwaukee Corrugating Co., Milwaukee, Wis.
Walworth Run Fdy. Co., Cleveland, Ohio

Furnaces—Warm Air.
American Furnace Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
Brillion Iron Works, Brillion, Wis.
Chicago Furnace Supply Co., Chicago, Ill.
Excelsior Steel Furnace Co., Chicago, Ill.
Floral City Heater Co., Monroe, Mich.
Forest City Fdy. & Mfg. Co., Cleveland, Ohio
Gray & Dudley Co., Nashville, Tenn.
Hall-Neal Furnace Co., Indianapolis, Ind.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess-Snyder Co., Massillon, Ohio
Homer Furnace Co., Coldwater, Mich.
International Heater Co., Utica, N. Y.
Kruse Co., Indianapolis, Ind.
Lamneck Co., W. E., Columbus, Ohio
Langenberg Mfg. Co., St. Louis, Mo.
Lennox Furnace Co., Marshalltown, Ia.; Syracuse, N. Y.
Liberty Foundry Co., St. Louis, Mo.
Marshalltown Heater Co., Marshalltown, Iowa
May-Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The Peoria, Ill.
Monitor Furnace Co., Cincinnati, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Oakland Foundry Co., Belleville, Ill.
Peninsular Stove Co., Detroit, Mich.
Quaker Mfg. Co., Chicago, Ill.
Robinson Furnace Co., Chicago, Ill.
Robinson Furnace Co., A. H., Cleveland, Ohio
Rybolt Heater Co., Ashland, Ohio
Schwab & Sons Co., R. J., Milwaukee, Wis.
Security Stove & Mfg. Co., Kansas City, Mo.
Standard Foundry & Mfg. Co., DeKalb, Ill.
Standard Furnace & Supply Co., Omaha, Neb.
St. Louis Heating Co., St. Louis, Mo.
Success Heater Mfg. Co., Des Moines, Iowa
Thomas & Armstrong Co., London, Ohio
Thatcher Co., Chicago, Ill.
Utica Heater Co., Utica, N. Y.
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steeel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio
Williamson Heater Co., Cincinnati, Ohio

Garages—Metal.
Milwaukee Corrugating Co., Milwaukee, Wis.

Glass—Wire.
David Lupton's Sons Co., Philadelphia, Pa.

Grilles.
Diamond Mfg. Co., Wyoming, Pa.
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Independent Register & Mfg. Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Grilles—Store Front.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Guards—Machine and Belt.
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler.
Berger Bros. Co., Philadelphia, Pa.

Hangers—Eaves Trough.
Berger Co., L. D., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Heaters—Cabinet.
Gray & Dudley Co., Nashville, Tenn.
Mueller Furnace Co., L. J. Milwaukee, Wis.
Peninsular Stove Co., Detroit, Mich.
Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—School Room.
Floral City Heater Co., Monroe, Mich.
International Heater Co., Utica, New York
Meyer Furnace Co., The Peoria, Ill.
Standard Furnace & Supply Co., Omaha, Neb.
Waterman-Waterbury Co., Minneapolis, Minn.

Hooks—Conductor.
Berger Co., L. D., Philadelphia, Pa.

Hotels
Fort Shelby Hotel, Detroit, Mich.

Humidifiers.
Robinson Furnace Co., Chicago, Ill.

Jobbers—Hardware.
Clark-Smith Hardware Co., Peoria, Ill.

Kitchen Utensils.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Lath—Expanded Metal.
Milwaukee Corrugating Co., Milwaukee, Wis.

Machines—Crimping.
Bertsch & Co., Cambridge City, Ind

Machinery—Culvert.
Bertsch & Co., Cambridge City, Ind.

Machines—Tinsmiths.
Bertsch & Co., Cambridge City, Ind.
Chicago Elbow Machine Co., Oak Park, Ill.
Dreis & Krump Mfg. Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Mailing Lists
R. L. Polk Co., Detroit, Mich.
Peck, Stow & Wilcox Co., Southington, Conn.
Unishear Co., The, New York, N. Y.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Metals—Perforated.
Diamond Mfg. Co., Wyoming, Pa.
Harrington & King Perforating Co., Chicago, Ill.

Miters.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Miters—Eaves Trough.
David Lupton's Sons Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Nails—Slating.
Hussey & Co., C. G., Pittsburgh, Pa.

Nails—Wire.
American Steel & Wire Co., Chicago, Ill.

Oil Burners.
Security Stove & Mfg. Co., Kansas City, Mo.
Quaker Mfg. Co., Chicago, Ill.

Ornaments—Sheet Metal.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.
Milwaukee Corrugating Co., Milwaukee, Wis.

Paint.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Pecora Paint Co., Philadelphia, Pa.

Patterns—Furnace & Stove.
Cleveland Castings Pattern Co., Cleveland, Ohio
Quincy Pattern Co., Quincy, Ill.
Vedder Pattern Works, Troy, N. Y.

Pipe and Fittings—Furnace.
Chicago Furnace Supply Co., Chicago, Ill.
Dunning, Inc., E. C., Milwaukee, Wis.
Excelsior Steel Furnace Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Robinson Furnace Co., Chicago, Ill.
Standard Furnace & Supply Co., Omaha, Neb.

Pipe and Fittings—Stove.
Excelsior Steel Furnace Co., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Pipe—Conductor.
Berger Bros. Co., Philadelphia, Pa.
Clark-Smith Hdw. Co., Peoria, Ill.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Friedley-Voshardt Co., Chicago, Ill.
Hussey & Co., C. G., Pittsburgh, Pa.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
New Jersey Zinc Sales Co., The, New York, N. Y.
Wheeling Corrugating Co., Wheeling, W. Va.

BUYERS' DIRECTORY

Posts—Steel Fence.
American Steel & Wire Co., Chicago, Ill.

Punches.
Bertsch & Co., Cambridge City, Ind.
Parker-Kalon Corp., New York, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Punches—Combination Bench and Hand.
Parker-Kalon Corp., New York, N. Y.
Whitney Metal Tool Co., Rockford, Ill.
Whitney Mfg. Co., W. A., Rockford, Ill.

Punches—Hand.
Whitney Metal Tool Co., Rockford, Ill.
Whitney Mfg. Co., W. A., Rockford, Ill.

Putty—Stove.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Pecora Paint Co., Philadelphia, Pa.

Quadrants—Damper.
Parker-Kalon Corp., New York, N. Y.

Radiator Cabinets
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Ranges—Combination Gas & Coal.
Quick Meal Stove Co., St. Louis, Mo.
Thatcher Co., Newark, N. J.

Ranges—Gas.
Quick Meal Stove Co., St. Louis, Mo.
Gray & Dudley Co., Nashville, Tenn.

Registers—Warm Air.
American Wood Register Co., Plymouth, Ind.
Chicago Furnace Supply Co., Chicago, Ill.
Eaglesfield Ventilator Co., Indianapolis, Ind.
Excelsior Steel Furnace Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Robinson Furnace Co., Chicago, Ill.
Rock Island Register Co., Rock Island, Ill.
Standard Furnace & Supply Co., Omaha, Neb.
Stearns Register Co., Detroit, Mich.
Tuttle & Bailey Mfg. Co., Chicago, Ill.
Walworth Run Fdy. Co., Cleveland, Ohio

Registers—Wood.
American Wood Register Co., Plymouth, Ind.
Chicago Furnace Supply Co., Chicago, Ill.
Eaglesfield Ventilator Co., Indianapolis, Ind.

Repairs—Stove and Furnace.
Hessler Co., H. E., Syracuse, N. Y.
Northwestern Stove Repair Co., Chicago, Ill.

Ridging.
American Rolling Mill Co., Middletown, Ohio
David Lupton's Sons Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Rivets—Stove.
The Kirk-Latty Co., Cleveland, Ohio

Roasters.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Rods—Stove.
The Kirk-Latty Co., Cleveland, Ohio

Rolls—Forming.
Bertsch & Co., Cambridge City, Ind.

Roofing Cement.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Pecora Paint Co., Philadelphia, Pa.

Roof—Flashing.
Hessler Co., H. E., Syracuse, N.Y.
Milwaukee Corrugating Co., Milwaukee, Wis.

Roofing—Iron and Steel.
American Roofing Mill Co., Middletown, Ohio
Cortright Metal Roofing Co., Philadelphia, Pa.
Friedley-Voshardt Co., Chicago, Ill.
Granite City Steel Works, Granite City, Ill.
Inland Steel Co., Chicago, Ill.
Merchant & Evans Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
National Enameling and Stamping Co., Granite City, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing—Tin.
Taylor Co., N. & G., Philadelphia, Pa.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing—Zinc.
New Jersey Zinc Sales Co., The, New York, N. Y.

Rubbish Burners.
Hart & Cooley Co., New Britain, Conn.

Sal—Ammoniac.
Special Chemicals Co., Waukegan, Ill.

Schools—Sheet Metal Pattern Drafting.
St. Louis Technical Institute, St. Louis, Mo.

Screws—Sheet Metal.
Parker-Kalon Corp., New York, N. Y.

Screens—Perforated Metal.
Harrington & King Perforating Co., Chicago

Shears—Hand and Power.
Double-Duty Mfg. Co., Aurora, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Peck, Stow & Wilcox Co., Southington, Conn.
Unishear Co., The, New York
Viking Shear Co., Erie, Pa.

Sheets—Black and Galvanized.
American Rolling Mill Co., Middletown, Ohio
Davis Co., Inc., C. S., Chicago, Ill.
Granite City Steel Works, Granite City, Ill.
Inland Steel Co., Chicago, Ill.
Merchant & Evans Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
National Enameling and Stamping Co., Granite City, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.
Wheeling Corrugating Co., Wheeling, W. Va.

Sheets—Iron.
American Rolling Mill Co., Middletown, Ohio
Merchant & Evans Co., Philadelphia, Pa.

Sheets—Tin.
Davis Co., Inc., C. S., Chicago, Ill.
Granite City Steel Works, Granite City, Ill.
Merchant & Evans Co., Philadelphia, Pa.
National Enameling and Stamping Co., Granite City, Ill.
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Zinc.
New Jersey Zinc Sales Co., The, New York, N. Y.

Shields—Register.
Beh & Co., New York, N. Y.

Shingles and Tiles—Metal.
Cortright Metal Roofing Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.
Wheeling Corrugating Co., Wheeling, W. Va.

Shingles—Asphalt.
Sall Mountain Co., Chicago, Ill.

Shingles—Zinc.
Milwaukee Corrugating Co., Milwaukee, Wis.

Sifters—Ash.
Diener Mfg. Co., G. W., Chicago, Ill.

Sky Lights.
David Lupton's Sons Co., Philadelphia, Pa.
Milwaukee Corrugating Co., Milwaukee, Wis.

Snips.
Peck, Stow & Wilcox Co., Southington, Conn.

Solder.
Chicago Solder Co., Chicago, Ill.
Double-Duty Elbow Co., Aurora, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Solder-Aluminum
Ziener Aluminum Solder Co., Rockford, Ill.

Soldering Furnaces.
Berns Co., Otto, Newark, N. J.
Burgess Soldering Furnace Co., Columbus, Ohio
Clayton & Lambert Mfg. Co., Detroit, Mich.
Diener Mfg. Co., G. W., Chicago, Ill.
Double Blast Mfg. Co., North Chicago, Ill.
Quick Meal Stove Co., St. Louis, Mo.

Soldering Supplies.
Double-Duty Elbow Co., Aurora, Ill.
Special Chemicals Co., Waukegan, Ill.

Specialties—Hardware.
Diener Mfg. Co., G. W., Chicago, Ill.
Hessler Co., H. E., Syracuse, N. Y.

Stars—Hard Iron Cleaning.
Fanner Mfg. Co., Cleveland, Ohio

Statuary.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.

Stampings—Metal.
American Tube & Stamping Co., Bridgeport, Conn.
Dunning, Inc., E. C., Milwaukee, Wis.
Stearns Register Co., Detroit, Mich.

Stove Pipe Reducers.
Milwaukee Corrugating Co., Milwaukee, Wis.

Stoves—Camp.
Quick Meal Stove Co., St. Louis, Mo.

Stoves—Gasoline and Oil.
Quick Meal Stove Co., St. Louis, Mo.

Stoves and Ranges.
Gray & Dudley Co., Nashville, Tenn.
Oakland Foundry Co., Belleville, Ill.
Peninsular Stove Co., Detroit, Mich.
Quick Meal Stove Co., St. Louis, Mo.
Thatcher Co., Newark, N. J.

Tacks, Staples, Spikes.
American Steel & Wire Co., Chicago, Ill.

Tile Cement—Elastic.
Pecora Paint Co., Philadelphia, Pa.

Tinplate.
Davis Co., Inc., C. S., Chicago, Ill.
Granite City Steel Works, Granite City, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
National Enameling and Stamping Co., Granite City, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Tools—Tinsmith's.
Bertsch & Co., Cambridge City, Ind.
Chicago Elbow Machine Co., Oak Park, Ill.
Double-Duty Mfg. Co., Aurora, Ill.
Dreis & Krump Mfg. Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peck, Stow & Wilcox Co., Southington, Conn.
Unishear Co., The, New York, N. Y.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Torches.
Berns Co., Otto, Newark, N. J.
Burgess Soldering Furnace Co., Columbus, Ohio
Clayton & Lambert Mfg. Co., Detroit, Mich.
Diener Mfg. Co., G. W., Chicago, Ill.
Double Blast Mfg. Co., North Chicago, Ill.
Quick Meal Stove Co., St. Louis, Mo.

Trade Extension.
Copper & Brass Research Association, New York, N. Y.
Sheet Steel Trade Extension Committee, Pittsburgh, Pa.

Transit Companies
Cleveland & Buffalo Transit Co., Cleveland, Ohio

Trimmings—Stove.
Fanner Mfg. Co., Cleveland, Ohio.

Ventilators.
Arex Company, Chicago, Ill.
Aeolus Dickinson Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Friedley-Voshardt Co., Chicago, Ill.
David Lupton's Sons Co., Philadelphia, Pa.
Kernchen Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.
Royal Ventilator Co., Philadelphia, Pa.
Standard Ventilator Co., Lewisburg, Pa.
Sturtevant Co., Boston, Mass.

Ventilators—Ceiling.
Eaglesfield Ventilator Co., Indianapolis, Ind.
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., New York
Sturtevant Co., B. F., Boston, Mass.

Windows—Steel.
David Lupton's Sons Co., Philadelphia, Pa.

Wire—Electrical.
American Steel & Wire Co., Chicago, Ill.

Wire Hoops.
American Steel & Wire Co., Chicago, Ill.

Wire Rope.
American Steel & Wire Co., Chicago, Ill.

Wrenches.
Coes Wrench Co., Worcester, Mass.

Zinc.
Merchant & Evans Co., Philadelphia, Pa.
New Jersey Zinc Co., The, New York, N. Y.

WANTS AND SALES

Any yearly subscriber to AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired.

BUSINESS CHANCES

LIGHTNING RODS—Dealers who are selling Lightning Protection will make money by writing us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable is endorsed by the Mutual Insurance Companies and hundreds of reliable dealers. Write today for samples and prices. L. K. DIDDIE CO., Marshfield, Wis.

For Sale—Sheet metal roofing and furnace business. Well established and with first-class reputation. A good stock of tools, 18-ft. steel brake, 1-30 inch forming roll; 1 turning machine, 1 wire, burring and beading machines, all stakes; 1 No. 2 Hercules shear, 1 Whitney punch, all in first-class condition; 1 new 1-ton Ford truck, 40-ft. new ladders, good condition, also furnace squaring shears, stock shears and all tools necessary; all for $2,500. Located in the Missouri Ozarks. Do not answer unless you have $1,500 cash. Address X-79, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 18-3t

For Sale—On account of death, forced to sell prosperous sheet metal and furnace business in large city close to Chicago. Shop fully equipped and doing business with established contractor and home trade. Only reliable parties considered. Very enticing proposition for a good going business. Act quickly. Address X-81, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 18-3t

For Sale—Sheet metal, furnace, fender and radiator shop in central Indiana city of 7,000 population. Only two tin shops in town. Good trade and reputation. Many small towns around. Plenty of tools and stock. Big shop. $500 takes all. Address X-74, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 16-3t

For Sale—One of the best paying plumbing, heating, and sheet metal businesses in eastern Iowa. Lots of work ahead. Fifteen percent discount for cash for a quick sale. Reason for selling account of health. Address X-73, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 16-3t

Wanted—To buy small furnace and sheet metal shop in Iowa or surrounding states. Address X-77, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 18-3t

For Sale—Established fully equipped tin shop in Fort Arthur, Texas. Population 40,000. Retiring on account of old age. Opportunity for a hustler. Must sell at great sacrifice for cash. Address P. A. Wutke, 1712 5th Street, Port Arthur.

HELP WANTED

Wanted—A first class foreman, experienced in all branches of sheet metal work in light and heavy materials, must be able to read blue prints, lay out accurately, steady and non drinking. This is a steady job in a Pennsylvania town where the best of conditions exist. State age, ability, wages expected, etc., in first letter and receive particulars by addressing X-82, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 19-3t.

Wanted—A first class sheet metal man. One who is familiar with estimating and furnace work. To take complete charge of a well equipped shop. Prefer to have man run same on percentage basis or buy part interest. Married man preferred. Write to Williams & Sons, 222 East Hughitt Street, Iron Mountain, Michigan. 19-3t.

Wanted—First class sheet metal worker. Must be well experienced in marquise, skylight and electric sign work and must be layout man. I am willing to pay $1.50 per hour to a man above the average who can turn out the work. Address Stuart Metal Works, Box 673, Stuart, Florida. 19-3t.

Wanted—A married man not over 40 years of age with family, in a live southern town of 18,000 population. Steady position for right man. Must be first class sheet metal worker, able to lay out work and design general sheet metal work. Read Genesis 37-17. Address Dawsey Sheet Metal Works, Dothan, Ala. 16-3t

Wanted — Side line on commission. Salesmen for a complete line of furnace fans and boosters. Will also send catalogs to furnace salesmen and those in the trade. Address Heating Systems & Supply Co., 107 W. Van Buren St., Chicago, Illinois. 18-3t

Wanted—A good, reliable sheet metal worker for both inside and outside work in a job shop. Wages $1.00 per hour. Address X-80, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 18-3t

Wanted—First class furnace salesman. Fine opportunity for man wishing to come to Colorado. Michael Heating Co., 414 W. Colfax, Denver, Colorado. 17-3t

Wanted—Sheet metal workers. Union shop. Ten dollars per eight hours. West Side Sheet Metal Works, Scranton, Pennsylvania. 18-3t

SITUATION WANTED

Situation Wanted — By conscientious married man with 15 years' experience in ventilation and warm air furnace selling experience. Now employed as traveling salesman in Wisconsin for furnaces. Will be open for position on January 1. Can hold present position. Address X-72, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 15-3t

Situation Wanted—By first class warm air heating, ventilating, blow pipe and dust collecting man; 23 years' experience; married and sober. Wants steady position. State wages, etc., in first letter. Illinois or Wisconsin preferred. Address B. J. Hawkins, 425 North 4th street, Iron River, Michigan. 16-3t

Situation Wanted—By first class warm air heating man. Understands the furnace code and installation work. Have had about 9 years' experience. Am 25 years of age. Want steady work with reliable firm. Address 3824 43rd Avenue, So., Minneapolis, Minnesota. 19-3t.

Situation Wanted—Must be steady position. Inside work. Would buy interest and run shop on shares. Illinois preferred. Address X-75, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 17-3t

SITUATION WANTED

Situation Wanted—By first class tinner and furnace man. Can do inside and outside work. 25 years at the trade. Nothing but steady job the year around. Am married. Can do anything that comes in any tin shop. Address W. J. Mack, 37 East Main Street, Saint Charles, Illinois. 16-3t

Situation Wanted—By first-class sheet metal worker and furnace installer. Want situation in Iowa, Minnesota or Nebraska. Can do anything that comes in a tin shop. Address X-78, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 18-3t

Situation Wanted—By first class heating and ventilating man with good reliable firm. 12 years' experience. Can layout and erect own work. Address X-76, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 17-3t

Situation Wanted—Furnace salesman and heating engineer of extraordinary ability to promote business, available now or December first. Address X-70, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinoies. 18-3t

TINNERS' TOOLS

For Sale—1 8 ft. Robinson brake, 1 31" Niagara square shear, both in good condition, and for sale at a bargain. Address L. J. Brien, Lock Box No. 104, Hart, Michigan. 17-3t

Wanted—Sheet metal press, six to ten ton. Must be in good condition. Address E-Z Fountain Company, Wakefield, Kansas. 17-3t

Wanted—To buy a Chicago Steel or Robinson brake, 8 or 10 ft.; also tinners' tools. Address W. H. Redmond, Auburn, Nebraska. 18-3t

BOOKS

Sheet Metal Duct Construction, by Neubecker—A treaties on the construction and erection of heating and ventilating ducts, including the cutting and forming of the metal, the laying out of the elbows, etc. A practical expert wrote this book and you'll find that it covers the subject thoroughly. By William Neubecker. Bound in cloth, 194 pages, 217 illustrations. Size 5½x8¼ inches. Price $2.00. Order from Book Dept., AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois.

Kinks and Labor Savings Methods for Sheet Metal Workers, Vols. 1 and 2—Volume I. There are hundreds of ideas and expedients, all contributed by sheet metal workers throughout the country, illustrated by cuts and original drawings. Cloth bound. Size 4½x7 inches. Price $1.00. Volume II written in same popular style as Volume I. Places at your disposal a comprehensive collection of ingenious ways of executing many practical tasks in much more simple way than if done in the regulation manner. Also contains special articles on Automobile Repairing; gives a very practical series of illustrated directions on erecting metal ceilings with ten guide rules which will save time, trouble and expensive mistakes. Price $1.00. Order from Book Dept., AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois.

The Ventilation Handbook, by Charles L. Hubbard. A practical book designed to cover the principles and practice of ventilation as applied to furnace heating; ducts, flues and dampers for gravity heating; fans and fan work for ventilation and hot blast heating by means of a comprehensive series of questions, answers and very plain descriptions easy to understand. Price $2.00. Order from Book Dept., AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois.

SPECIAL NOTICES

The Rate for Special Notices — displayed want ads — $3.00 per inch per insertion.

A FEW MEN

with practical furnace selling experience needed to cover 3 or 4 desirable sales territories, with complete heating line.

Only high grade men will be considered.

Territories must be assigned by early December. Write promptly and in confidence.

L. J. Mueller Furnace Co., Milwaukee, Wisconsin 19-tf

SITUATION WANTED

A strictly first class retail furnace salesman. Now employed, wants to make change. Fully capable of taking charge of furnace department. Prefer the east. Not a cheap man, but earn my salary. Can change on three weeks' notice. Address L-87, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 19-3t

FURNACE SALESMAN

We want a general salesman with a thorough knowledge of cast furnace trade, but who prefers to sell a steel furnace. Must be a volume getter. Write, giving connections for past five years, age, nationality and references. The Lennox Furnace Co., Marshalltown, Iowa. 19-2t.

SALESMEN WANTED

Have very good territory openings including such states as: Illinois, Kentucky, Tennessee and others, on a complete line of furnaces which sell at popular prices. This line of furnaces embodies all of the practical and worthwhile features of modern furnace construction. If you know how to lay out furnace jobs, and can produce and develop business, we have an attractive proposition for you. Address L-86, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 19-2t.

SPECIAL NOTICES

FURNACE SALESMEN WANTED

Further expansion of our business in the Eastern States in 1927 will require the services of two or three more salesmen. They must be competent warm air heating men, understand the Standard Code and have ability to produce business. Exceptional opportunity for some real business-getters.

The Lennox Furnace Co., Syracuse, New York 17-4t

FURNACE SALESMEN

Experienced retail furnace salesmen and furnace installers; splendid proposition for resourceful, energetic men of good character and habits; excellent opportunity to get established in business with a specialty that insures attractive profits; young man, financially responsible preferred, although good moral risks will be interviewed; only those with successful records need apply. Address L-88, care AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois. 19-3t

SPECIAL NOTICES

WANTED

High Class Stove Salesman for Pennsylvania Territory

Man wanted must be familiar with Pennsylvania trade and have had a successful record in that territory. We have established trade and will give the right man an opportunity of making real money on salary and commission basis. All inquiries treated confidentially. FULLER & WARREN CO., Troy, New York. 18-tf

FOR SALE

In Hartford, Conn., sheet metal business (established 1908) manufacturing blower systems, ventilating systems, dust collecting systems, roof ventilators and general sheet metal work of every description. Complete equipment of patterns, power and hand machines and tools, manufactured stock, office equipment and supplies, drafting room equipment and supplies, etc. Prospective orders will pay for it in short time. Owner retiring. Opportunity of a lifetime. For full particulars, address C. H. Keeney, P. O. Box 292, Unionville, Conn. 17-3t

One insertion of a want ad for warm air furnace salesmen in AMERICAN ARTISAN brings deluge of 208 applications

RUDY DIVING FLUE

The Rudy Furnace Company

Manufacturers of

PIPE AND PIPELESS FURNACES

WAREHOUSES
PHILADELPHIA
PORTLAND, ORE
DENVER
CHICAGO
CANTON, O
KANSAS CITY
SALT LAKE CITY
ST. PAUL
ATLANTA
SPOKANE
OMAHA

ADDRESS ALL CORRESPONDENCE TO OWOSSO, MICHIGAN

OFFICERS
A.E. RUDOLPH
PRESIDENT-GEN MGR
CHARLES J. BIEN
VICE PRES-SALES MGR
EUGENE GILBERT
TREASURER
ARTHUR F. FRAZEE
SECY-MGR OF ADV
EDWIN F. SNYDER
FACTORY MANAGER

Owosso, Michigan
October
Twentieth
Nineteen Twenty-Six

American Artisan & Hardware Record
620 S. Michigan Blvd.
Chicago, Illinois

Gentlemen:

The Rudy Furnace Company can testify to the effectiveness of the American Artisan & Hardware Record as an advertising medium.

In our recent advertisement asking for six additional salesmen for expanding business in several territories, we were deluged after just one issue in your publication with 208 applications.

There is a host of material in these applications, comprising of some of the best looking material we have ever been privileged to select from. We are going to get our six salesmen and they will be top-notchers.

We thank you and we ask that you please discontinue the ad.

Very truly yours,

A. F. Frazee

Secretary & Adv. Mgr.
RUDY FURNACE COMPANY

A. F. Frazee
C C R

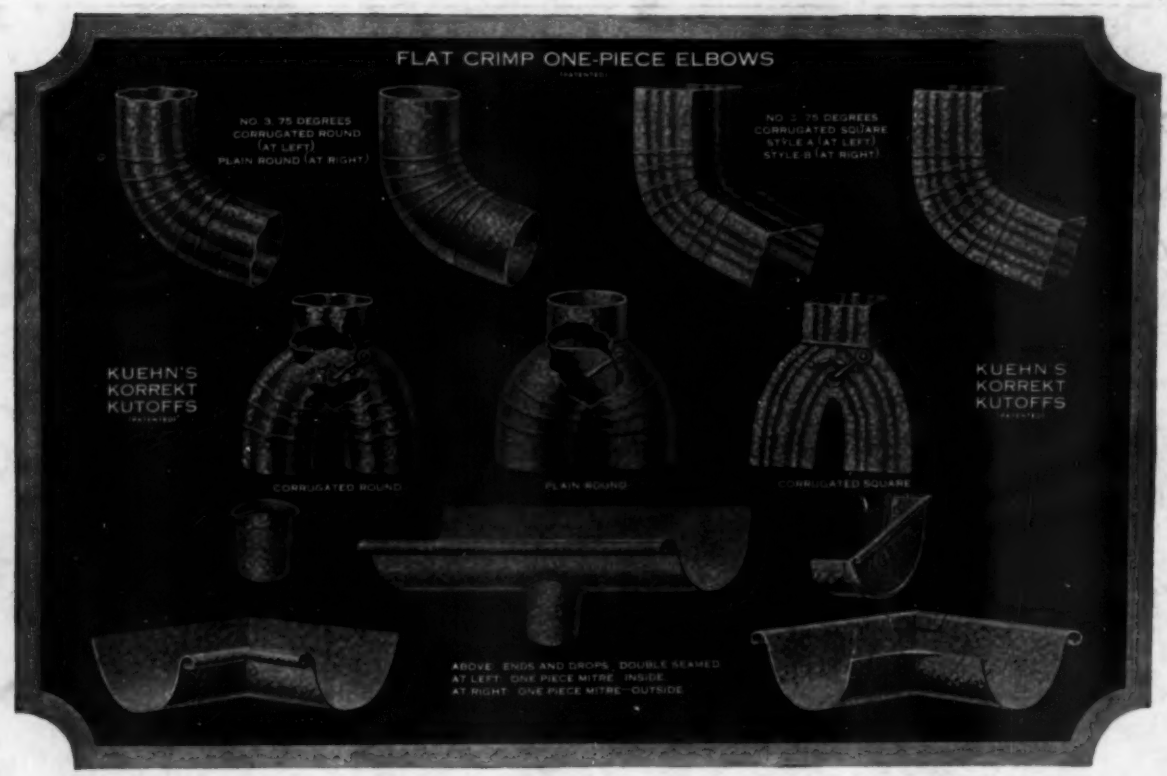
No. 5 of a Series of Letters

AMERICAN ARTISAN—620 South Michigan Avenue
CHICAGO, ILLINOIS

YOU may send us full information concerning your publication and plans for a result producing advertising campaign.

Name .....

Address .....



Treat Your Trade to *Super*-Quality

UNIFORMLY dependable quality—practical, patented designs and features not found in any other line—backed by the progressive Milcor organization policy for keeping equipment and facilities ahead of demand so as to insure speedy service always; these are the circumstances quite largely responsible for the extensive use of Milcor Products.

But the good judgment of the Building Trades and the Public has also been a most important factor in making the Milcor Line so popular. Sheet metal men who are determined to serve their customers' interests best, always insist on Milcor—and preferably, Milcor Products made from pure Copper, or from the famous rust-resisting ARMCO Ingot Iron.

Milcor Products are made in Steel; "Coppered Metal;" "Wilder Metal"; Zinc; Copper; and pure, rust-resisting

Ingot Iron

The Milcor Line of Eaves Trough, Conductor Pipe and Trimmings, Roofing, etc., is complete in every detail and meets every requirement for efficiency in erection. Treat your Trade to Milcor *super*-quality. It's a habit that pays!

MILWAUKEE CORRUGATING COMPANY, MILWAUKEE, WIS.
CHICAGO, ILL. KANSAS CITY, MO. LA CROSSE, WIS.

MILCOR

SUPER-QUALITY SHEET METAL PRODUCTS